

Five-Year Review Report

Second Combined Five-Year Review Report
for
Double Eagle and Fourth Street Refinery Sites
Oklahoma City
Oklahoma County, Oklahoma
OKD007188717 and OKD980696470

May 2007

PREPARED BY:

**U.S. Environmental Protection Agency
Region 6
Dallas, Texas**

and

**Oklahoma Department of Environmental Quality
Oklahoma City, Oklahoma**

**SECOND COMBINED FIVE-YEAR REVIEW FOR
DOUBLE EAGLE AND FOURTH STREET REFINERY SITES
OKLAHOMA CITY, OKLAHOMA**

This memorandum documents approval of the second combined Five-Year Review Report for the Double Eagle and Fourth Street Superfund Sites by the U.S. Environmental Protection Agency (EPA).

Summary of Five-Year Review Findings

The selected remedy for soils at the Double Eagle and Fourth Street sites was solidification and stabilization, then off-site disposal. The combined remedy for the contaminated ground water beneath both sites included: institutional controls; notification prior to drilling; filing deed notices; establishing a monitoring program; and additional evaluation of the groundwater following removal of the contaminant sources.

Progress since last combined Five-Year Review

As documented in the Explanation of Significant Differences approved on January 19, 2006, the combined remedy for contaminated ground water beneath both sites was modified after the actions described above were implemented. Further groundwater monitoring was discontinued after three years. Additional investigations have shown that natural attenuation is taking place, and the potential receptors or targets of contamination, the North Canadian River and deeper usable portions of the Garber-Wellington aquifer, are not at risk at this time.

The remedy appears to be performing as intended and is currently protective of human health and the environment. No issues of concern were identified during this review.

Determination

The remedies for the Double Eagle and Fourth Street Refinery sites are performing as intended and are protective of human health and the environment.

U.S. Environmental Protection Agency

By: Robert H. Bragler
Samuel Coleman, P.E.

Director
Superfund Division

U.S. Environmental Protection Agency, Region 6

Date: 5/15/07

Table of Contents

Five-Year Review Report.....	1
List of Acronyms	6
Executive Summary	7
Five-Year Review Summary Form.....	8
I. Introduction	10
II. Site Chronology.....	12
III. Background.....	16
Physical Characteristics	16
Land and Resource Use	17
History of Contamination	17
Initial Response Actions	18
Basis for Taking Action.....	19
Human Health and Environmental Impacts.....	19
Feasibility Study.....	20
IV. Remedial Actions.....	20
Remedial Action Objectives	20
Remedy Selection.....	20
Remedy Implementation.....	21
Operation and Maintenance	24
V. Progress Since the Last Five-Year Review.....	24
VI. Five-Year Review Process	26
Administrative Components	26
Community Involvement	26
Document Review	26
Data Review	27
Site Inspection.....	27
Interviews.....	27
VII. Technical Assessment	28
Question A: Is the remedy functioning as intended by the decision documents?.....	28
Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?	29
Question C: Has any other information come to light that could call into question the protectiveness of the remedy?.....	29
Technical Assessment Summary.....	29
VIII. Issues.....	29
IX. Recommendations and Follow-up Actions	30
X. Protectiveness Statement	30
XI. Next Review	30

Tables

Table 1: Chronology of Site Events12
Table 2: Annual System Operations/O&M Costs24
Table 3: Actions Taken Since the Last Five-Year Review.....25
Table 4: Issues29
Table 5: Recommendations and Follow-up Actions30

Appendix

- Appendix 1 – Site Location Maps
- Appendix 2 - List of Documents Reviewed
- Appendix 3 – Time Graphs of DEQ Monitoring Results
- Appendix 4 – Photographs
- Appendix 5 – Site Inspection Checklist
- Appendix 6 – Interviews
- Appendix 7 – Community Involvement, DEQ Legal Notices
- Appendix 8 – Deed Notice Search Memo

List of Acronyms

ARARs	Applicable or relevant and appropriate requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 also known as Superfund, Amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA).
CFR	Code of Federal Regulations
COC	Chemical of concern
DEQ	Oklahoma Department of Environmental Quality
EPA	United States Environmental Protection Agency
FCOR	Final Close Out Report
FS	Feasibility study
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and maintenance
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
PPM	Parts per million
RA	Remedial action
RAG	Remedial action goal
RAO	Remedial action objective
RD	Remedial design
RI	Remedial investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986. (See CERCLA.)
TDS	Total dissolved solids
USGS	United States Geological Survey

Executive Summary

Pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation & Liability Act (“CERCLA” or “Superfund”), 42 United States Code (USC) §9621(c), the second combined five-year review of the remedy in place has been completed for the Double Eagle Refinery Co. and Fourth Street Abandoned Refinery Superfund Sites (“sites” or “Double Eagle and Fourth Street sites”), located in Oklahoma County, Oklahoma. This review covers both sites since the Double Eagle and Fourth Street sites had similar Source Control Operable Units (OU) and share a single Ground Water OU. The results of the five-year review indicate that the remedy is protective of human health and the environment. No deficiencies were noted that currently impact the protectiveness of the remedy.

Under the statutory requirements of Section 121(c) of CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA), P. L. 99-499, and the subordinate provisions of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) 300.430(f)(4)(ii), performance of five-year reviews are required for sites where hazardous substances remain on-site above levels that allow unlimited use and unrestricted exposure. This situation applies to the Double Eagle and Fourth Street sites. The U.S. Environmental Protection Agency (EPA) completed the first combined five-year review at the sites on July 29, 2002.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): Double Eagle Refinery Company and Fourth Street Abandoned Refinery		
EPA ID (from WasteLAN): OKD007188717 and OKD980696470		
Region: 6	State: OK	City/County: Oklahoma City/Oklahoma County
SITE STATUS		
NPL status: <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify) _____		
Remediation status (choose all that apply): <input type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
Multiple OUs?* <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Construction completion date: 09/7/1999 and 09/27/1996	
Has site been put into reuse? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO part of Fourth Street is being reused		
REVIEW STATUS		
Lead agency: <input checked="" type="checkbox"/> EPA <input checked="" type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency _____		
Author name: Oklahoma Department of Environmental Quality and EPA, Region 6		
Author title: Amy Brittain	Author affiliation: Oklahoma DEQ	
Review period: November 2006 to May 2007		
Date(s) of site inspection: 12/19/2006		
Type of review: <div style="text-align: right; margin-top: 5px;"> <input checked="" type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion </div>		
Review number: <input type="checkbox"/> 1 (first) <input checked="" type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify) _____		
Triggering action: <input type="checkbox"/> Actual RA Onsite Construction at OU # _____ <input type="checkbox"/> Actual RA Start at OU# _____ <input type="checkbox"/> Construction Completion <input checked="" type="checkbox"/> Previous Five-Year Review Report <input type="checkbox"/> Other (specify) _____		
Triggering action date (from WasteLAN): 07/29/2002		
Due date (five years after triggering action date): on or before 07/29/2007		

Five-Year Review Summary Form, cont'd.

Issues: The second combined five-year review for the sites indicates that the remedial actions set forth in the decision documents for the sites continue to be implemented as intended by the decision documents. This assessment has been made based on a review of data available for the sites, site inspections, and technical evaluation.

Recommendations and Follow-up Actions: None.

Protectiveness Statement(s): The remedies implemented at the Double Eagle and Fourth Street sites in Oklahoma City, Oklahoma are protective of human health and the environment.

Second Combined Five-Year Review Report Double Eagle and Fourth Street Refinery Sites

The United States Environmental Protection Agency (EPA) Region 6 and the Oklahoma Department of Environmental Quality (DEQ) conducted a second combined five-year review of the remedial action implemented at the Double Eagle Refinery Co. and Fourth Street Abandoned Refinery Superfund Sites (“sites” or “Double Eagle and Fourth Street sites”), located in Oklahoma County, Oklahoma, for the period between July 2002 (when the first five-year review was completed) and May 2007. This review covers both sites since the Double Eagle and Fourth Street sites had similar Source Control Operable Units (OU) and share a single Ground Water OU. The purpose of a five-year review is to determine whether the remedy at a site remains protective of human health and the environment, and to document the methods, findings, and conclusions of the five-year review in a report. Five-Year Review Reports identify issues found during the review, if any, and make recommendations to address the issues. This Second Combined Five-Year Review Report documents the results of the review for the Double Eagle and Fourth Street Refinery Superfund sites, conducted in accordance with EPA guidance on five-year reviews.

EPA guidance on conducting five-year reviews is provided by Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-03B-P, *Comprehensive Five-Year Review Guidance*. EPA and DEQ personnel followed the guidance provided in this OSWER directive in conducting the five-year review performed for the Double Eagle and Fourth Street sites.

I. Introduction

The purpose of a five-year review is to determine whether the remedy at the Double Eagle and Fourth Street sites is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them. EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA § 121 (c), as amended, states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such review, and any actions taken as a result of such reviews.

The NCP part 300.430(f)(4)(ii) of the Code of Federal Regulations (CFR) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The Oklahoma Department of Environmental Quality (DEQ) conducted the second combined five-year review of the remedy implemented at the Double Eagle and Fourth Street Superfund Sites in Oklahoma City, Oklahoma. This review was conducted by the DEQ Project Manager for the sites. This report documents the results of the review.

This is the second combined five-year review for the Double Eagle and Fourth Street Superfund sites. The triggering action for this statutory review is the initiation of the remedial action on July 17, 1997 to clean up the ground water operable unit and the date of the first combined five-year review which was July 29, 2002. In accordance with the EPA five-year review guidance, the five-year review for the Double Eagle and Fourth Street sites is being conducted because the implemented remedial action resulted in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure. The second combined review for the Double Eagle and Fourth Street Superfund Sites must be completed on or before July 29, 2007.

II. Site Chronology

Table 1: Chronology of Site Events

Fourth Street Refinery		
Event	Operable Unit	Actual Completion
Discovery	Sitewide	July 1, 1980
Preliminary Assessment	Sitewide	May 1, 1985
Proposal for NPL	Sitewide	June 24, 1988
Final Listing on NPL	Sitewide	March 31, 1989
Removal	Sitewide	September 27, 1989
RI/FS Negotiations	Sitewide	October 6, 1989
Administrative Records	Sitewide	September 28, 1992
Combined RI/FS	Source Control OU	September 28, 1992
Record of Decision	Source Control OU	September 28, 1992
Treatability Study	Source Control OU	September 28, 1992
Combined RI/FS	Ground Water OU	September 30, 1993
Record of Decision	Ground Water OU	September 30, 1993
Remedial Design	Source Control OU	August 10, 1994
Remedial Design	Ground Water OU	March 17, 1995
Remedial Action	Source Control OU	April 30, 1996
Quarterly Ground Water Sampling Event	Ground Water OU	December 1996
Remedial Action	Ground Water OU	February 20, 1997
Quarterly Ground Water Sampling Event	Ground Water OU	March 1997
Quarterly Ground Water Sampling Event	Ground Water OU	June 1997
Quarterly Ground Water Sampling Event	Ground Water OU	September 1997
Quarterly Ground Water Sampling Event	Ground Water OU	December 1997
Quarterly Ground Water Sampling Event	Ground Water OU	March 1998
Quarterly Ground Water Sampling Event	Ground Water OU	July 1998
Quarterly Ground Water Sampling Event	Ground Water OU	September 1998
Quarterly Ground Water Sampling Event	Ground Water OU	June 1999

Fourth Street Refinery		
Event	Operable Unit	Actual Completion
Community Involvement	Sitewide	September 1, 1999
Quarterly Ground Water Sampling Event	Ground Water OU	October 1999
Community Involvement	Source Control OU	December 1, 1999
Quarterly Ground Water Sampling Event	Ground Water OU	December 1999
Quarterly Ground Water Sampling Event	Ground Water OU	April 2000
Semiannual Ground Water Sampling Event	Ground Water OU	September 2000
Five-Year Remedy Assessment	Sitewide	October 18, 2000 and July 29, 2002
Semiannual Ground Water Sampling Event	Ground Water OU	March 2001
Semiannual Ground Water Sampling Event	Ground Water OU	February 2002
Natural Attenuation Sampling Event	Ground Water OU	April 2002
Semiannual Ground Water Sampling Event	Ground Water OU	December 2002
Semiannual Ground Water Sampling Event	Ground Water OU	April 2003
Semiannual Ground Water Sampling Event	Ground Water OU	September 2003
Off-site Source of Contamination Study	Ground Water OU	January 2005
Plugging of all site wells	Ground Water OU	October 2005
Explanation of Significant Differences	Ground Water OU	January 2006
Final Close Out Report	Sitewide	January 2006
Beginning of Site O&M Period	Sitewide	March 2006

Double Eagle Refinery		
Event	Operable Unit	Actual Completion
Preliminary Assessment	Sitewide	May 1, 1980
Discovery	Sitewide	June 1, 1980
Proposal for NPL	Sitewide	June 24, 1988
Admin Order on Consent	Sitewide	December 7, 1988
Final Listing on NPL	Sitewide	March 31, 1989
RI/FS Negotiations	Sitewide	November 29, 1989
Administrative Records	Sitewide	September 28, 1992
Combined RI/FS	Source Control OU	September 28, 1992
Record of Decision	Source Control OU	September 28, 1992
Treatability Study	Source Control OU	September 28, 1992
Combined RI/FS	Ground Water OU	July 28, 1993
Removal	Sitewide	April 3, 1994
Record of Decision	Ground Water OU	April 19, 1994
Remedial Design	Ground Water OU	March 17, 1995
Quarterly Ground Water Sampling Event	Ground Water OU	December 1996
Remedial Action	Ground Water OU	February 20, 1997
Quarterly Ground Water Sampling Event	Ground Water OU	March 1997
Remedial Design	Source Control OU	April 30, 1997
Quarterly Ground Water Sampling Event	Ground Water OU	June 1997
Quarterly Ground Water Sampling Event	Ground Water OU	September 1997
Quarterly Ground Water Sampling Event	Ground Water OU	December 1997
Quarterly Ground Water Sampling Event	Ground Water OU	March 1998
Quarterly Ground Water Sampling Event	Ground Water OU	July 1998
Quarterly Ground Water Sampling Event	Ground Water OU	September 1998
Quarterly Ground Water Sampling Event	Ground Water OU	June 1999
Community Involvement	Sitewide	September 1, 1999

Double Eagle Refinery		
Event	Operable Unit	Actual Completion
Quarterly Ground Water Sampling Event	Ground Water OU	October 1999
Community Involvement	Source Control OU	December 21, 1999
Quarterly Ground Water Sampling Event	Ground Water OU	December 1999
Remedial Action	Source Control OU	March 29, 2000
Quarterly Ground Water Sampling Event	Ground Water OU	April 2000
Semiannual Ground Water Sampling Event	Ground Water OU	September 2000
Semiannual Ground Water Sampling Event	Ground Water OU	March 2001
Semiannual Ground Water Sampling Event	Ground Water OU	February 2002
Natural Attenuation Sampling Event	Ground Water OU	April 2002
Five-Year Remedy Assessment	Sitewide	July 29, 2002
Semiannual Ground Water Sampling Event	Ground Water OU	December 2002
Semiannual Ground Water Sampling Event	Ground Water OU	April 2003
Semiannual Ground Water Sampling Event	Ground Water OU	September 2003
Off-site Source of Contamination Study	Ground Water OU	January 2005
Plugging of all site wells	Ground Water OU	October 2005
Explanation of Significant Differences	Ground Water OU	January 2006
Final Close Out Report	Sitewide	January 2006
Beginning of Site O&M Period	Sitewide	March 2006

III. Background

Physical Characteristics

The Double Eagle Superfund Site occupies the Southeast Quarter (SE 1/4) of Section 35, Township 12 North, Range 3 West, Indian Meridian, Oklahoma County, Oklahoma City, Oklahoma. Located at 301 N Rhode Island (generally South of NE 4th Street and West of Martin Luther King Boulevard), the site extends over approximately 12 acres and is bounded to the north by the Union Pacific Railroad tracks and to the east and west by vacant lots zoned for industrial land use. A "Pilot Truck Stop" is operating to the south. Martin Luther King Boulevard lies on the east side of the site as an overpass to the railroad tracks.

Prior to the remedial action, the following features were located within the Double Eagle site: a sludge lagoon, six smaller earthen impoundments, 13 steel buildings, one fire tube boiler, two pipe heat exchangers, five vacuum precoat/scraper filters, two concrete settling cells, and approximately 100 steel tanks of varying dimensions. The tanks contained residual sludge and most equipment was contaminated to various degrees. One of the concrete cells contained residual waste material mixed with rainwater.

The Fourth Street Superfund Site occupies the Southwest Quarter (SW 1/4) of Section 36, Township 12 North, Range 3 West, Indian Meridian, Oklahoma County, Oklahoma City, Oklahoma. Located at 2200 Block NE 4th Street (South of NE 4th Street and East of Martin Luther King Boulevard), the site is bounded to the south by the Union Pacific Railroad tracks, to the north by Northeast Fourth Street, and to the east by Interstate 35. Martin Luther King Boulevard lies on the west side of the site as an overpass to the railroad tracks. Active industrial facilities (which have not been associated with past site operations) also lie adjacent to the mid-northern portion of the site, just south of NE 4th Street.

The Fourth Street site extends over three contiguous tracts of land totaling approximately 27 acres. An active industrial facility is currently operating on the westernmost tract, which is part of the original refinery property, but is now owned and operated by a separate individual. This tract is referred to as the Pipe Storage Yard, consistent with the active facility's current operations. The Pipe Storage Yard contained buried sludge material beneath the site. The middle tract of the site contained the majority of contaminated material, a large tar mat area and surface ponds. This tract is referred to as the Main Site Area, consistent with the fact that most of the contaminated material and scattered debris were found on this tract. The eastern tract of land contained only surficial contamination carried from the Main Site Area via surface drainage. This tract is referred to as the Eastern Drainage Area.

The Pipe Storage Yard and the Main Site Area were once the former operations area, as evidenced by historical aerials and the extensive piping network discovered during investigations at the site. The gravel/sand cover in the Pipe Storage Yard was ineffective in covering buried

contaminated sludges; consequently, surface seeps were apparent. The Main Site Area contained several discrete areas of concern: a tar mat area, two smaller earthen impoundments, one small concrete sump, and numerous pieces of abandoned refinery equipment and debris from past uncontrolled dumping. Remnants of the dismantled refinery in the Main Site Area included a warehouse foundation, three horizontal tank stands and foundations, an oil well derrick, and an abandoned concrete oil well derrick foundation.

The Double Eagle site contributed to off-site contamination in an area just south of the site, known as the "Radio Tower Area." The contamination at the Radio Tower Area consisted of a surficial tar matrix, which covered approximately 0.25 acre.

Both the Fourth Street site and the Double Eagle site contributed to the contamination of an off-site area called Parcel H. The contamination at the Parcel H Area, which was attributable to past site operations, included two surficial ponds, comprising approximately 0.5 acre. Approximately half of the Parcel H contaminated area was addressed under the Fourth Street cleanup activities and the other half was addressed as part of the Double Eagle remedial action.

Land and Resource Use

Although industrial areas surround the sites, the land use within a 1-mile radius of both sites is mixed industrial and residential. A small neighborhood is located about ¼ mile to the northwest of the Martin Luther King Boulevard and Northeast Fourth Street intersection. Four schools (Douglas High School, Dunbar School, Bath School, and Edwards School) and two recreational facilities are located within a 1-mile radius of the sites. Recreational areas close to the sites include the Douglas Community Center, Douglas Community Park, and Washington Park. A Pipe Storage Yard sits on the west side of the Fourth Street site. There are two large truck stops to the south of the sites. Within a 1-mile radius of the sites are many commercial and small industrial facilities.

Part of the Fourth Street site is currently being used as a pipe storage yard. The rest of the Fourth Street site and all of the Double Eagle site are not being re-used at this time. Both sites are owned by private land owners.

Both of the Records of Decisions (RODs) identified the upper ground water zone non-usable (Class III aquifer) due to the presence of high total dissolved solids (TDS). Ground water sampling and monitoring activities have confirmed this fact. Ground water sampling has shown that natural attenuation is taking place, and the potential receptors or targets of contamination, the North Canadian River and the deeper usable portions of the Garber-Wellington aquifer, are not at risk at this time. No users of the aquifer have been identified.

History of Contamination

The Double Eagle site collected, stored, and re-refined used oils and distributed the recycled product. The refinery was active as early as 1929 with historical aerial photographs available as

early as 1941. Generally, early refining was conducted on the western portion of the site and expanded toward the eastern portion as the operations increased.

The Double Eagle site recycled approximately 500,000 to 600,000 gallons of used motor oil per month into finished lubricating oil. The recycling process consisted of the addition of sulfuric acid, settling, and filtration with bleaching clays via a filter press. This process generated approximately 80,000 gallons of oily sludge per month. Sludges were initially sent to an off-site disposal facility, now the Hardage Criner Superfund Site located in Criner, Oklahoma. Later, sludges were disposed of in on-site impoundments and a sludge lagoon until the late 1960's to early 1970's. Double Eagle continued to accept waste oil for storage in on-site storage tanks until 1980.

On-site and off-site visual inspections by the EPA Field Investigations Team in May of 1985 indicated that a preliminary sampling inspection should be conducted. Off-site sampling in the southwestern drainage area and at the Radio Tower area during January of 1986 revealed elevated levels of target compounds that were also found in the waste impoundments on-site.

The Fourth Street site collected, stored, and re-refined used oils and distributed the recycled product. Refinery operations at the Fourth Street site apparently recycled used oils by the use of sulfuric acid in clarification of the used oils. Sludges generated by the reclamation process were disposed in on-site impoundments. The refinery was active in the early 1940's and was noted on historical aerial photographs available as early as 1941. Refining operations were conducted on land owned by the Chicago, Rock Island and Pacific Railway Company.

Planet Oil and Refining Company participated in the waste oil reclamation business during the early part of the 1940's through the early 1960's. Elliot Refining Company conducted waste oil reclamation activities during the late 1940's through the 1960's. Salyer Refining Company performed waste oil reclamation operations from the late 1940's through the 1960's. Operations ceased in the late 1960's or early 1970's. Exposed underground pipes at many locations indicated that an extensive piping network was utilized during operations.

Both sites were found to be contaminated with metals and organic contaminants in the soil and ground water. Also both sites contained acidic sludges found in on-site lagoons or pits.

Initial Response Actions

After reviewing the data, EPA determined that the contaminants posed a potential health threat at both sites. The Regional Administrator authorized a removal action in 1989 for the Fourth Street site. The removal action consisted of constructing a fence and posting warning signs around areas of contamination thus mitigating the potential threat to the public of direct contact with the hazardous materials found on-site. In December 1988 the EPA issued an administrative order to the Double Eagle Refining Company to install a fence and warning signs around the site. In April 1989 under EPA oversight the fence was installed and warning signs posted.

The Double Eagle and Fourth Street sites were both proposed for the National Priorities List (NPL) on June 24, 1988 and placed on the NPL on March 31, 1989.

Basis for Taking Action

The purpose of the response actions conducted at the sites was to protect public health and welfare and the environment from releases or threatened releases of hazardous substances from the sites.

A Remedial Investigation/Feasibility Study (RI/FS) for both the Double Eagle and Fourth Street sites was conducted in 1992 for the Source Control Operable Unit (OU). The RIs determined the types and amounts of contaminants present at the sites and discovered the extent of contamination. The RIs indicated that chemicals of concern (COCs) attributable to site activities included polycyclic aromatic hydrocarbons, chlorinated hydrocarbons and polychlorinated biphenyls, alkyl benzenes, ketones, lead, arsenic, and antimony. Lead was considered the primary COC given the widespread occurrence in all media and the extremely high concentrations (approximately 15,000 parts per million (ppm) for the Fourth Street site and up to 20,000 ppm for the Double Eagle site) in sludge and contaminated soils and sediments.

A RI/FS was conducted at both sites in 1993 for the Ground Water OU. The RIs found that the ground water under the sites was contaminated with similar COCs to the Source Control OU for the sites. The shallow alluvial and shallow Garber Sandstone Formation were found to be contaminated with COCs above MCLs. No wells were drilled into the deeper Garber-Wellington Aquifer and it was assumed that this deeper aquifer was a potential drinking water source.

Human Health and Environmental Impacts

The purpose of the human health risk characterization is to estimate and characterize the potential human cancer risks and non-cancer adverse health effects associated with exposure to contaminants released from each site. The risk characterization performed on the Source Control OUs indicated that future on-site workers would be exposed to unacceptable levels for both carcinogenic and non-carcinogenic effects of the site COCs. Results of the risk calculations from the Ground Water OUs indicated that adults and children are at risk from exposure to contamination in the ground water for potential carcinogenic and toxic effects.

The environmental risks showed that environmental receptors, in particular migratory fowl, could be adversely affected by site related contaminants. Toxicity tests indicated that there was potential for toxic effects to aquatic life from the water in the Parcel H impoundment.

The RODs stated that actual or threatened releases of hazardous substances from these sites, if not addressed, could pose an imminent and substantial endangerment to public health, welfare, or the environment.

Feasibility Study

The Feasibility Studies (FS) developed and evaluated a range of alternatives to remediate contamination in the Source Control OU and Ground Water OU. The Source Control remedial alternatives for both sites were No Action, Limited Action, On-site Stabilization and Capping, On-site Stabilization and Disposal in an On-site Landfill, On-site Stabilization and Disposal in an Off-site Landfill, Excavation, On-site Incineration, and On-site Capping of Ash, and Excavation, Off-site Incineration and Disposal of Ash. The Ground Water remedial alternatives for both sites were No Action, Limited Action, and Inorganic Precipitation and Activation Carbon Treatment of Organic Contaminants.

IV. Remedial Actions

Remedial Action Objectives

The remedial action objectives (RAOs) for the Double Eagle and Fourth Street Source Control OUs are to minimize potential exposure by direct contact or inhalation and to reduce the potential for migration of contaminants into the surface waters and ground water. The two RAOs for the Double Eagle Ground Water OU are to ensure that future potential users of the lower Garber-Wellington aquifer are not exposed to contaminants from the site and to ensure that the North Canadian River is not impacted by contaminants from the site.

Remedy Selection

The EPA Regional Administrator for Region 6 signed the RODs for the Double Eagle and Fourth Street Source Control OUs on September 28, 1992. In the RODs, EPA selected Alternative 5 – Neutralization, Excavation, On-site Stabilization, and Off-site Landfill Disposal, as the remedy.

The major components of the Double Eagle Source Control OU Selected Remedy included:

- Excavation of the contaminated material in the Radio Tower area (approximately 1,500 cubic yards) and Parcel “H” (approximately 1,200 cubic yards)
- Consolidation of this material with the contaminated material on the Double Eagle property
- Demolition of on-site structures and disposal of the asbestos insulation, as necessary
- Use of the surface water in the impoundments in the stabilization process
- On-site stabilization of 42,000 cubic yards of the consolidated material to immobilize and address the hazardous characteristics of the contaminants
- Disposal of the stabilized material in a fully permitted off-site landfill
- Maintenance of the landfill and ground water monitoring around the perimeter of the landfill

The major components of the Fourth Street Source Control OU Selected Remedy included:

- Excavation of the contaminated material on Parcel “H” (approximately 1,200 cubic yards)
- Consolidation of this material with the contaminated material on the Fourth Street property
- Demolition of on-site structures and disposal of the asbestos insulation, as necessary
- Use of the surface water in the impoundments in the stabilization process
- On-site stabilization of 42,000 cubic yards of the consolidated material to immobilize and address the hazardous characteristics of the contaminants
- Dispose of the stabilized material in a fully permitted off-site landfill

The EPA Regional Administrator for Region 6 signed the ROD for the Fourth Street Ground Water OU on September 30, 1993 and signed the ROD for the Double Eagle Ground Water OU on April 19, 1994. In the RODs, EPA selected Alternative 2 – Limited Action as the remedy.

The major components of the Double Eagle and Fourth Street Ground Water OU Selected Remedies included:

- Installation of warning signs to require notification prior to drilling in the area.
- A deed notice filed to notify land owners of the hazards associated with the contaminated ground water in the area of the site.
- Installation of additional deeper monitoring wells further down-gradient to ensure that contaminants do not migrate deeper, or to a receptor point off-site, and determine if an off-site source of contamination exists.
- Establishment of a routine (quarterly sampling for the first two years, then semi-annually for the following three years (in the Double Eagle ROD)) monitoring and maintenance program for ground water sampling and modeling to evaluate contaminant level reductions following removal of the contaminant source.
- Routine inspections to ensure that public use of the upper zone of the Garber-Wellington Aquifer does not occur prior to attainment of the remedial action objectives.
- Five-Year review of the site to determine if further actions need to be taken with regard to the ground water. As part of the 5-year review, data analysis and ground water modeling are included to assess the adequacy of the monitoring and maintenance plan.
- Contingency measures (which include active treatment) that can be implemented if the ground water monitoring indicates an increase in contaminant concentrations (either vertically or horizontally).

Remedy Implementation

The Remedial Design (RD) for the Fourth Street Source Control OU was performed between June 1993 and August 1994 by Fluor Daniel. The Remedial Action (RA) for the Source Control OU at the Fourth Street site was performed between March 1995 and April 1996 by Fluor Daniel. The RA consisted of on-site neutralization and stabilization of wastes containing lead and/or acid exceeding the numerical remedial action goals (RAGs). Hydrated lime and cement

kiln dust were mixed with waste materials to neutralize the sulfuric acid and stabilize the lead. 91,200 tons of the treated waste materials were transported and disposed of off-site at the East Oak Landfill in Oklahoma City, Oklahoma. The Source Control OU RA also included the restoration of areas affected by remedial activities and the cleaning and disposing of contaminated equipment and structures. Future source control operation and maintenance activities are not required since all source material above RAGs was removed from the site.

The RD for the Double Eagle Source Control OU was performed between June 1993 and April 1997 by Fluor Daniel. The Remedial Action (RA) for the Double Eagle Source Control OU was performed between August 1997 and March 2000 by Tetra Tech EM, Inc. The initial steps of the RA involved asbestos abatement and demolition of existing structures at the Double Eagle site, which consisted of nine buildings and 59 tanks. Treatment reagents and the treatment method for the Double Eagle Source Control OU were first addressed in the Draft Bench Scale Treatability Study by Fluor Daniel in 1992. The final remedy, which involved adding cement kiln dust and lime to the waste, was included in the Double Eagle ROD and was described in detail in Fluor Daniel's RD. During the Pilot Waste Treatment Demonstration, conducted during the RA, problems were encountered with stabilizing leachable lead and generating sulfur dioxide. As a result, additional reagents were evaluated and tested. Eventually, Portland cement and Class C fly ash were utilized as the treatment reagents for most of the contaminated waste material. Cement kiln dust was used to a lesser extent. These reagents were mixed with the acid sludges to (1) solidify the contaminated waste material into a workable material, (2) neutralize the sulfuric acid in the contaminated waste material, and (3) stabilize the leachable lead in the contaminated waste material. A total of 44,186 cubic yards of both the treated waste and the contaminated waste material exceeding the RAGs were transported and disposed of off-site at the East Oak Landfill in Oklahoma City, Oklahoma, which was permitted to accept these wastes. Future source control operation and maintenance activities are not required since all source material above RAGs was removed from the site.

The RD for the Fourth Street Ground Water OU was performed between March 1994 and March 1995. The RD for the Double Eagle Ground Water OU was performed between June 1993 and April 1997. The Ground Water OU RA for the two sites was combined since they share one ground water contaminant plume. Fluor Daniel implemented the RA in two phases.

During Phase I of the RA, the following activities were performed:

- Five speed borings were advanced and geophysically logged to a depth of 200 feet.
- Nineteen piezometers were installed to a depth approximately 5 feet into the ground water. The piezometers were developed and water levels were measured weekly for a month.
- The 938-foot deep production well that existed on the Double Eagle property was plugged and abandoned to eliminate the possibility of downward migration of site-related contaminants.

After the completion of Phase I activities, the data were analyzed and the locations and depths of the Phase II monitoring wells were determined. The Phase II monitoring wells included two upper monitoring wells installed 10 feet into the top of the bedrock (approximately 60 feet below

ground surface) and six deep monitoring wells installed to a depth just above the significant shale layer detected during the speed borings (approximately 150 to 175 feet below ground surface).

The shallower monitoring wells were identified as "upper" monitoring wells, and the deeper monitoring wells were identified as "deep" monitoring wells. In order to be consistent, this terminology is used for the discussion of the five-year review data. Phase I data was used to establish a monitoring well network for the RA. The RA monitoring well network consisted of a total of thirteen wells: five upper monitoring wells (BMW-1 through BMW-5); and the eight Phase II monitoring wells (upper monitoring wells BMW-6A and BMW-7 and deep monitoring wells BMWD-1 through BMWD-6A). The locations of the monitoring wells are shown in Appendix 1. The 22 existing alluvial wells, BMW-6, and the 19 piezometers were abandoned during the Phase II activities. Also during Phase II warning signs were installed.

The DEQ conducted quarterly ground water monitoring of the 13 Garber-Wellington monitoring wells between December 1996 and April 2000. Semi-annual sampling occurred between September 2000 and September 2003. Time graphs of the concentration results of the monitoring events are attached in Appendix 3. Results indicated that the concentrations of site contaminants are decreasing except in some wells where there may be off-site sources of contamination. In December 2004 and January 2005 the DEQ drilled additional wells off-site near wells BMW-6A and BMWD-1. The results of the additional well study concluded that there are off-site sources of contamination to the North of the sites.

The United States Geological Survey (USGS) performed an evaluation of the effectiveness of natural attenuation in 2002. The USGS report verified that natural attenuation was reducing the levels of contaminant concentrations.

The investigations that were performed at the site have shown that natural attenuation is taking place, and that the potential receptors or targets of contamination, the North Canadian River and deeper usable portions of the Garber-Wellington aquifer, are not at risk at this time. Hence, in 2005, the DEQ and EPA determined that further monitoring of the ground water of the sites was not warranted. The decision to discontinue ground water monitoring was also based on the fact that the remedial action objectives for the sites was met because the ground water in the vicinity of the sites is not used as water supply, the DEQ is monitoring semi-annually to ensure that the public does not use contaminated ground water in the area, the extremely high concentrations of total dissolved solids make the ground water undesirable as a water supply source, and the North Canadian River is not threatened by site contaminants.

The DEQ plugged all existing on-site wells in October 2005. The EPA issued an Explanation of Significant Differences (ESD) for both sites in January 2006. The basis for the ESDs was the results of the quarterly and semi-annual monitoring performed by the DEQ between 1996 and 2003, the results of the additional well study performed by the DEQ in 2004 and 2005, the study conducted by the USGS in 2002 which verified that natural attenuation was reducing the levels of contaminants, and that the ground water in the vicinity of the sites is not being used as a water

supply. The ESDs documented a final decision to discontinue further semi-annual monitoring. At that time studies indicated that no further action was necessary in regards to the ground water.

The remedial action objective for the Source Control OUs, to minimize potential exposure by direct contact or inhalation and to reduce the potential for migration of contaminants into the surface waters and ground water, has been accomplished by the remedial actions at the sites. A Remedial Action Report for the Fourth Street Source Control OU was completed in 1996 and the Remedial Action Report for the Double Eagle Source Control OU was completed in 2000. The remedial action objectives for the Ground Water OUs, to ensure that future potential users of the lower Garber-Wellington aquifer are not exposed to contaminants from the site and to ensure that the North Canadian River is not impacted by contaminants from the site, have also been met by the remedial actions at the sites. Therefore, the EPA issued a Final Close Out Report (FCOR) for both sites in March 2006. The FCORs document that construction activities for the Source Control OU and Ground Water OU have been completed.

Operation and Maintenance

DEQ assumed Operation and Maintenance (O&M) of the sites in March 2006. O&M consists of maintaining the institutional controls on the site and semi-annual search of well drilling records to insure that no one drills drinking water wells on or near the sites. DEQ performed the well drilling record search in April 2006 and October 2006. It is estimated that O&M activities will cost \$138 per year. No O&M money has been expended to date.

Table 2: Annual System Operations/O&M Costs

Dates		Total Cost rounded to nearest \$1,000
From	To	
October 2006	January 2007	\$0

V. Progress Since the Last Five-Year Review

Since the first combined five-year review was conducted in July 2002, the semi-annual sampling was completed, natural attenuation was evaluated, off-site sources of contamination were evaluated, the site wells were plugged, ESDs were issued, FCORs were issued, and the site went into the O&M phase.

The protectiveness statement from the first combined five year review was:

“The remedy is expected to be protective of human health and the environment upon attainment of ground water cleanup goals, through natural attenuation, which is expected to require 60 to 150 years. In the interim, exposure pathways that could result in unacceptable risks are being controlled and institutional controls are preventing exposure to, or the ingestion of, contaminated ground water. All direct contact threats from site

soils and sediments have been addressed through solidification and stabilization followed by off-site disposal of contaminated soil and sediments. Long-term protectiveness of the remedial action will be verified by continuing the routine ground water monitoring and maintenance program to monitor natural attenuation and the migration of contaminants. Current monitoring data indicate that the remedy is functioning as required to achieve ground water cleanup goals.”

This protectiveness statement is misleading because the remedial action objectives for both sites Ground Water OUs were not attainment of ground water cleanup goals. The remedial action objectives for the Ground Water OUs as stated in the RODs are to ensure that future potential users of the lower Garber-Wellington aquifer are not exposed to contaminants from the site and to ensure that the North Canadian River is not impacted by contaminants from the site. The protectiveness statement has been corrected in this 5-year review to say: because the remedial actions at all operable units are protective, the sites are protective of human health and the environment.

The five recommendations and follow-up actions listed by the first combined five year review are listed in Table 3 below. All of the issues have been resolved by the DEQ and EPA. Table 3 below also lists the actions that were taken to resolve the recommendations.

Table 3: Actions Taken Since the Last Five-Year Review

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Contingency measures have not been evaluated	Evaluate risk associated with increasing concentrations, devise and implement contingency plan	EPA		After review of site data and the determination that the site's remedial action objectives have been met, contingency measures were determined not to be necessary.	2002-2006
Potential source(s) of off-site contamination for upper and lower aquifers not investigated	Further evaluate the properties of the Garber-Wellington aquifer near the sites	DEQ	2003	In 2002 the DEQ RCRA unit investigated other industrial properties in the area, found nothing. In 2004 and 2005 the DEQ installed additional up gradient wells, found that off-site source of contamination does exist.	2002, 2004, 2005
Re-establish baseline contamination levels for the lower aquifer	Communicate with EPA reasons for deviation	DEQ	2002	The DEQ developed a Statistical Analysis Plan within Quality Assurance Project Plan.	2002

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Ground water samples not analyzed for all COCs listed in the Ground Water OU ROD.	Review current ground water sampling plan	EPA/DEQ	2002	The EPA and DEQ project managers discussed this issue and decided to continue monitoring for parameters in Sampling Plan.	2002/2003
Language on warning signs does not satisfy ROD requirements	Implement warning signs according to the ROD	DEQ	2002	The DEQ posted appropriate signs at the sites.	2002

VI. Five-Year Review Process

Administrative Components

The five-year review team consisted of Amy Brittain and Dennis Datin of the DEQ. The review was conducted from November 2006 to July 2007. The tasks for the five-year review included:

1. Develop a project schedule.
2. Review of existing site data.
3. Inspection of the sites on December 19, 2006.
4. Inspection of the site repository on December 19, 2006.
5. Publish a public notice stating that a five-year review was underway, and
6. Prepare the five-year review report.

Community Involvement

The community was notified in the Daily Oklahoman on November 21, 2006 and in the Black Chronicle on December 7, 2006 that a five-year review was being conducted. A copy of the Press Release issued by the DEQ is provided as an attachment to this report in Appendix 7.

Upon signature, the Second Combined Five-Year Review Report will be placed in the information repositories for each site, both local and at the EPA Region 6 office in Dallas, Texas. A notice will then be published in the local newspaper to summarize the findings of the review and announce the availability of the report at the information repositories.

Document Review

The following documents were reviewed to complete this five-year review:

- The first combined 5-year review, 2002
- The Record of Decision documents, 1992-1994
- Double Eagle Source Control OU Remedial Action Completion Report, 2000

- Fourth Street Source Control OU Remedial Action Completion Report, 1996
- The Final Close Out Reports, 2006
- The Explanation of Significant Differences, 2006
- Ground water sampling reports, 1996-2003
- USGS report, 2004
- Off-site Source of Contamination Study Report, 2005
- Plugging of Monitoring Wells Memo, 2006

Data Review

As part of the long term remedial action for the sites the ground water was sampled quarterly for five years and semi-annually for three years. The results of the sampling show that COC trends tend to be decreasing, except for chlorinated solvents in a few wells. The off-site wells BMW-6A and BMW-1 showed an increasing trend in chlorinated solvent concentrations, which prompted the DEQ to drill additional wells in the area. The results of the off-site study indicate that there are off-site sources of chlorinated solvent contamination. The United States Geological Survey (USGS) performed an evaluation of the effectiveness of natural attenuation in 2002. The USGS report indicated that natural attenuation was taking place at the site.

Site Inspection

Amy Brittain, Dennis Datin, and Kelly Dixon of the DEQ conducted a site inspection on December 19, 2006. The visual inspection revealed that the sites looked to be in good condition. There was no evidence of drilling or digging on the sites. It was observed that the front gate to the Double Eagle site was open.

Interviews

On January 29, 2007, Jimmie Hammontree with the City of Oklahoma City Planning Department was interviewed. His only concern was that the Fourth Street site does not have visible warning signs along the street. The DEQ informed him that the front gate of Double Eagle was open and that the City could install a lock on the gate if they wish to do so. The city is working on helping redevelop this area of the city, called the "Reno Corridor." The city has also been looking at adjacent properties in this area under the city's Brownfields program and has been working to redevelop both Superfund sites.

On January 30, 2007, Bart Canellas with the EPA was interviewed. He is the remedial project manager for both sites for EPA. He had no problems with the sites.

On January 31, 2007, Dennis Datin with the DEQ was interviewed. He is the project manager for the Source Control OU for the DEQ. He had no problems with the sites.

On February 1, 2007, George Pettigrew with the US Agency for Toxic Substances and Disease Registry was interviewed. He did not know of any problems with the sites.

On February 2, 2007, Robert Gregory from the Land Legacy Trust was interviewed. The Land Legacy Trust is working with the City of Oklahoma City on the redevelopment of the Double Eagle site. He had no problems with the clean-up of the sites.

VII. Technical Assessment

An overall assessment of the remedy implemented at the sites was conducted to confirm that the selected remedy is operating according to the ROD expectations and remains protective of human health and the environment. The assessment was used to primarily answer the following questions:

- Is the remedy functioning as intended by the decision documents?
- Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?
- Has any other information come to light that could call into question the protectiveness of the remedy?

Question A: Is the remedy functioning as intended by the decision documents?

The decision documents for the Double Eagle and Fourth Street sites are the two Source Control OU RODs and the two Ground Water OU RODs. All activities at the sites were consistent with the RODs, and with the RD and RA statements of work.

All contaminated soil above the site RAOs was excavated, treated and disposed of off-site at a permitted solid waste landfill. No O&M activities are necessary for the Source Control OU because the site soil was cleaned-up to commercial/industrial levels.

The ground water sampling under the Ground Water OU RA demonstrated that natural attenuation was taking place, that off-site sources of contamination exist, that potential users of the lower Garber-Wellington aquifer are not exposed to contaminants from the site, and that the North Canadian River is not impacted by contaminants from the site. The 2006 ESD determined that further ground water monitoring is not necessary at the sites. The wells were plugged by the DEQ.

DEQ's O&M activities for the Ground Water OU include: a search of well drilling records to insure that no drinking water wells are installed in the area of the sites; and routine inspections to insure that the future reuse of the sites is consistent with clean-up activities that were performed on the sites. DEQ filed deed notices in the Oklahoma County Courthouse to notify landowners of the clean-up activities that have taken place. On February 5, 2007, the DEQ went to the County Courthouse, looked thru the deed records, and found both deed notices readily available to the public (see Appendix 8).

The issues raised in the last five year review have been resolved. The remedy is functioning adequately for both sites. There have been no changes in the land use of the surrounding areas since the remedy began.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

The baseline risk assessments conducted during the 1992 and 1993 RI/FSs were based on an exposure scenario for future workers and ingestion of ground water. Current and future land use are expected to remain commercial/industrial on-site and mixed use off-site and the state is ensuring through O&M activities that no one drinks the ground water. The sites are in the Reno redevelopment corridor and the City of Oklahoma City Planning Department is actively working on the redevelopment of these sites and the surrounding areas. Changes in risk assessment methodologies since the time of the RODs do not call into question the protectiveness of the remedy. There have been no changes in regulations that would change any of the risk-based RAGs that were set for the sites.

The remedial action complies with all applicable or relevant and appropriate requirements (ARARs). These include the EPA and DEQ rules and regulations cited in the RODs and ESDs. Because all surface contamination has been removed from the sites and institutional controls are in place to insure that no people drink the ground water, no risk recalculation/assessment is necessary for these sites.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No.

Technical Assessment Summary

The technical assessment, based on the data review, site inspection, and technical evaluation indicates that the remedial actions selected for the sites continue to be implemented as intended by the decision documents.

VIII. Issues

Table 4: Issues

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
None		

IX. Recommendations and Follow-up Actions

Table 5: Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
None						

X. Protectiveness Statement

Because the remedial actions at all operable units are protective, the sites are protective of human health and the environment.

XI. Next Review

The next combined five-year review, the third for the sites, will be due within five years from the date of this report.

Appendix 2

List of Documents Reviewed

Fluor Daniel, Fourth Street Refinery Site, Source Control OU, Final Remedial Action Completion Report, September 1996.

Oklahoma Department of Environmental Quality, Ground water data, 1996-2003.

Oklahoma Department of Environmental Quality, Additional Well Sampling Event Report, August 2005.

Oklahoma Department of Environmental Quality, Memorandum: Plugging of all monitoring wells at the Double Eagle and 4th Street sites, January 2006.

Tetra Tech, Double Eagle Refinery Remedial Action Completion Report, Source Control OU, February 2000.

U.S. Environmental Protection Agency, Comprehensive Five-Year Review Guidance, (OSWER No. 9355.7-03B-P or EPA 540-R-01-007), June 2001.

U.S. Environmental Protection Agency, Double Eagle Refinery Co., Explanation of Significant Differences, January 2006.

U.S. Environmental Protection Agency, Double Eagle Refinery Co., Final Close Out Report, March 2006.

U.S. Environmental Protection Agency, Double Eagle Refinery Site Record of Decision Ground Water OU, April 1994.

U.S. Environmental Protection Agency, Double Eagle Refinery Site Record of Decision Source Control OU, September 1992.

U.S. Environmental Protection Agency, First Combined Five-Year Review Report for the Double Eagle and Fourth Street Refinery Sites, July 2002.

U.S. Environmental Protection Agency, Fourth Street Abandoned Refinery, Explanation of Significant Differences, January 2006.

U.S. Environmental Protection Agency, Fourth Street Abandoned Refinery, Final Close Out Report, March 2006.

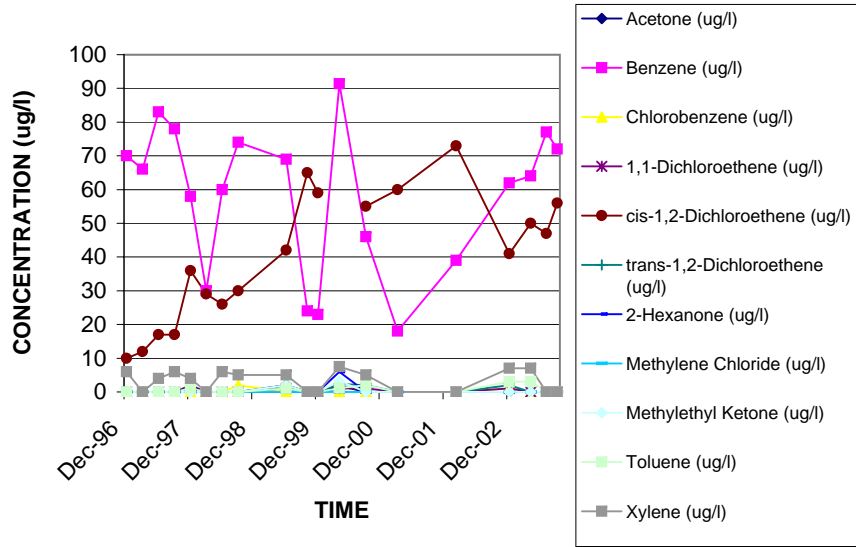
U.S. Environmental Protection Agency, Fourth Street Refinery Site Record of Decision Ground Water OU, September 1993.

U.S. Environmental Protection Agency, Fourth Street Refinery Site Record of Decision Source Control OU, September 1992.

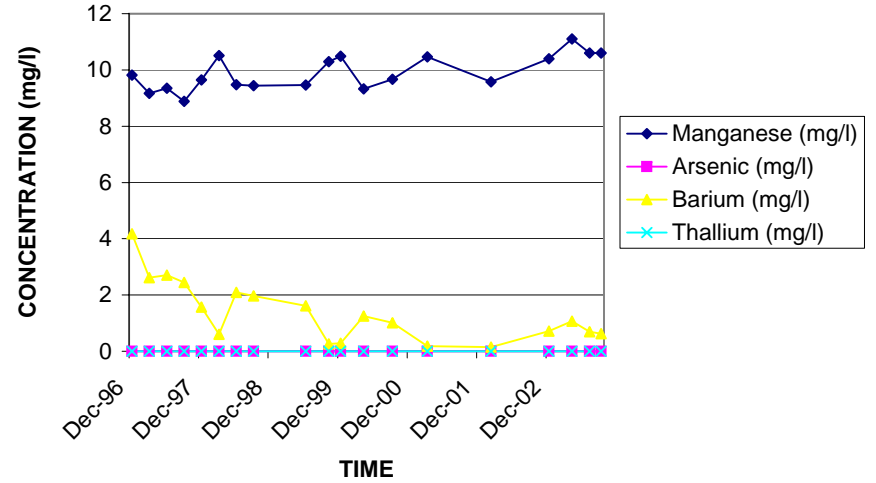
U.S. Geological Survey, Reductive Dechlorination of Chlorinated Ethenes Under Oxidation-Reduction Conditions and Potentiometric Surfaces in Two Trichloroethene-Contaminated Zones at the Double Eagle and Fourth Street Sites in Oklahoma City, Oklahoma, 2004.

Appendix 3

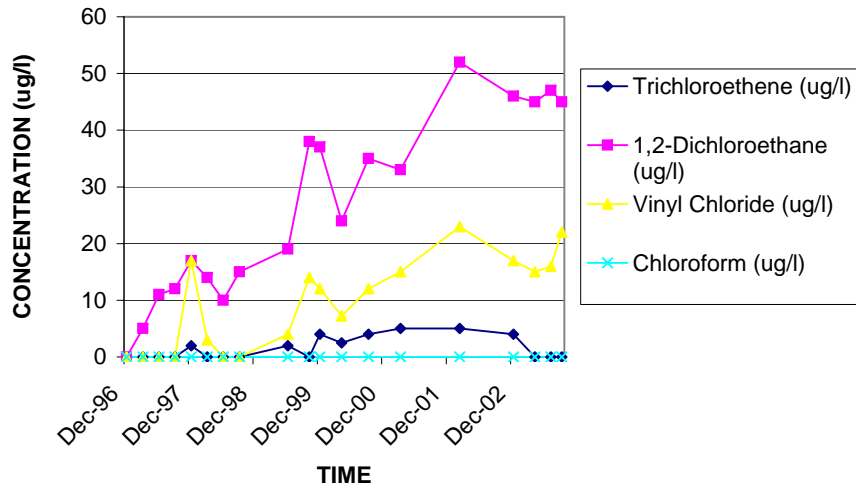
BMW-1 VOCS



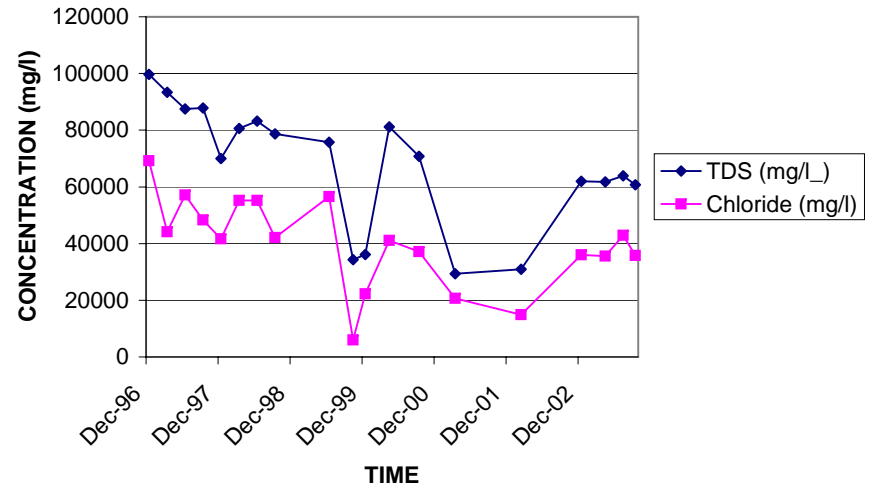
BMW-1 METALS



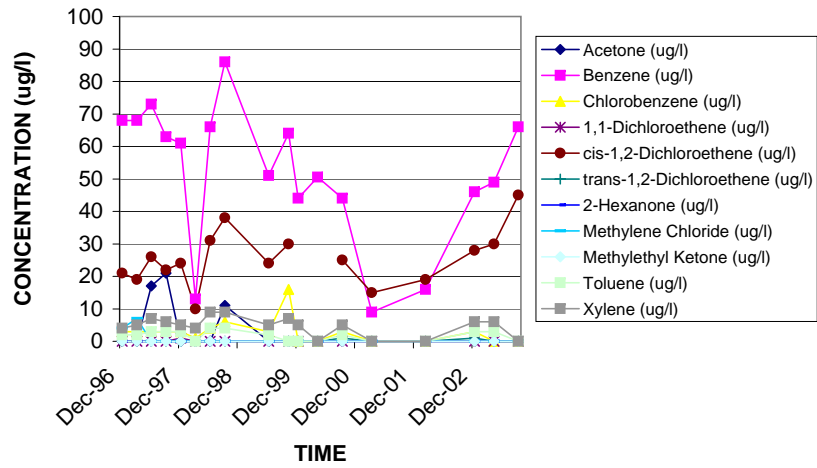
BMW-1 CHLORINATED VOCS



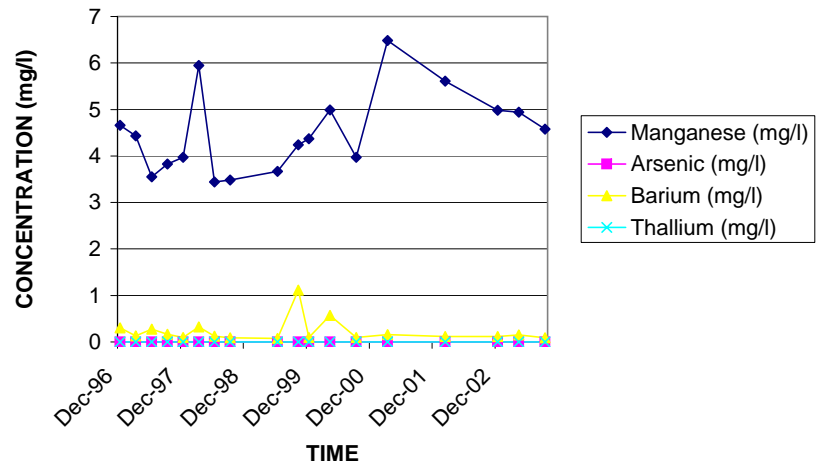
BMW-1 TDS AND CHLORIDE



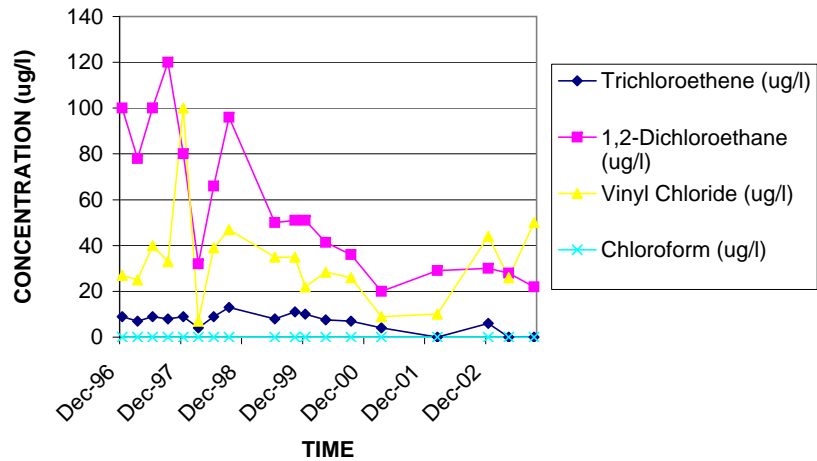
BMW-2 VOCS



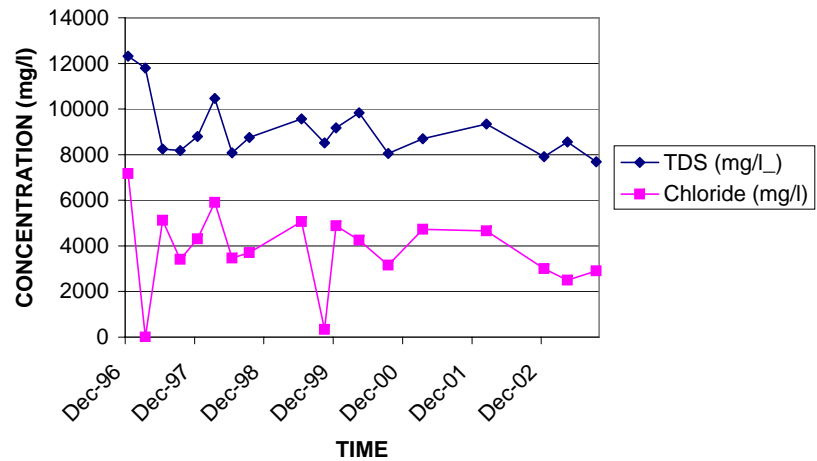
BMW-2 METALS



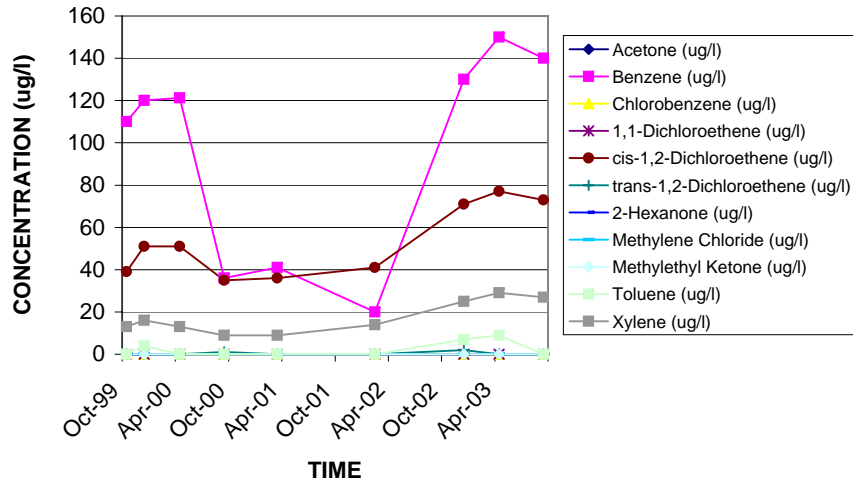
BMW-2 CHLORINATED VOCS



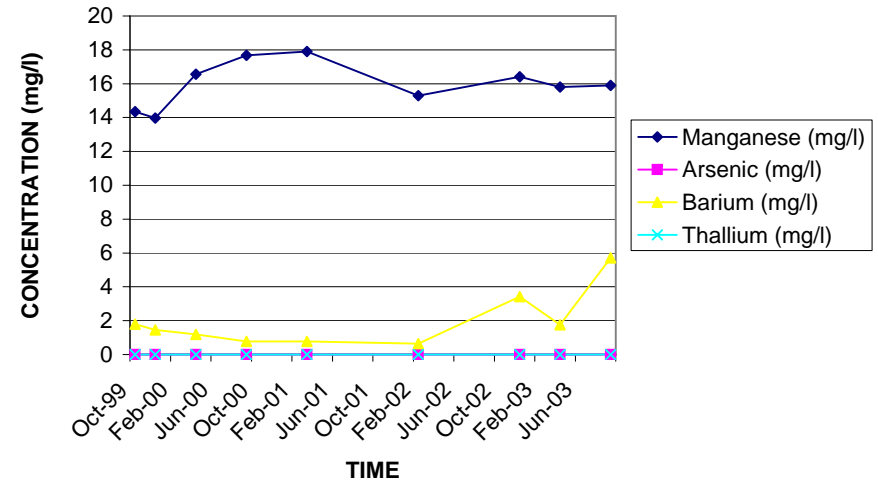
BMW-2 TDS AND CHLORIDE



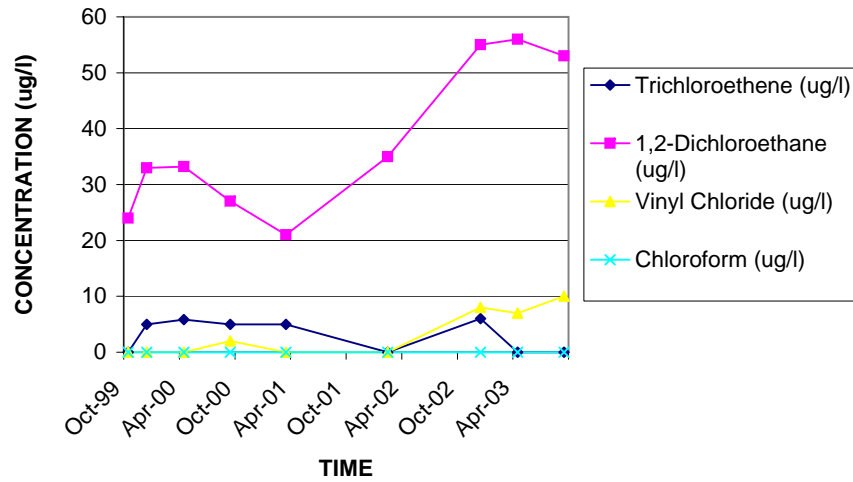
BMW-3A VOCS



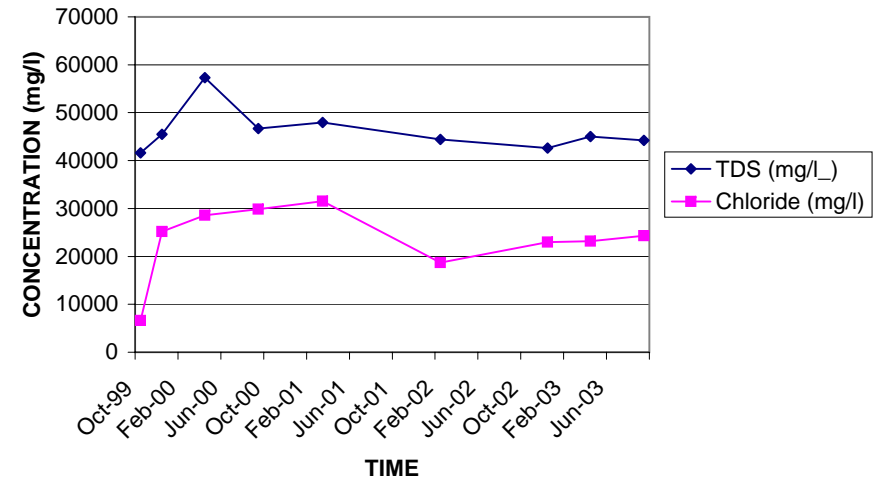
BMW-3A METALS



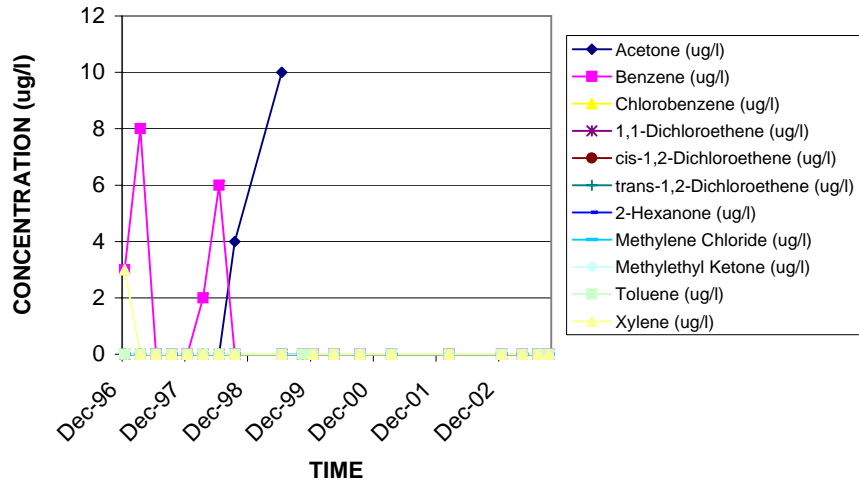
BMW-3A CHLORINATED VOCS



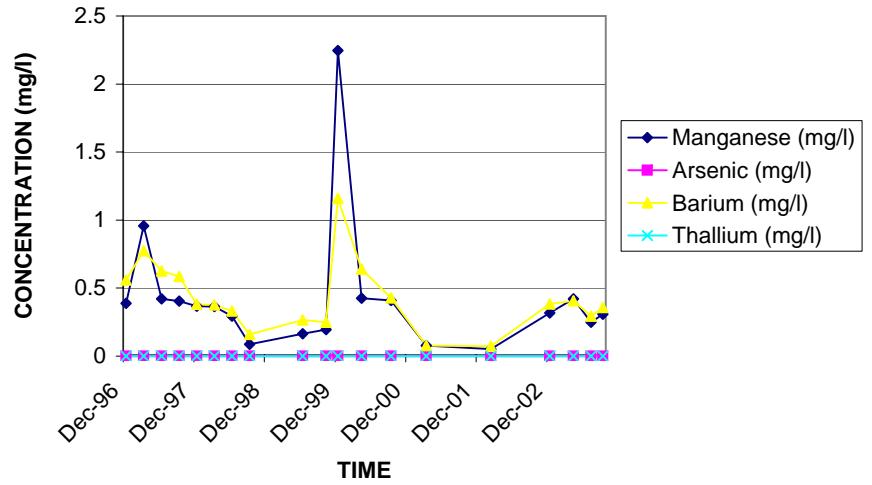
BMW-3A TDS AND CHLORIDES



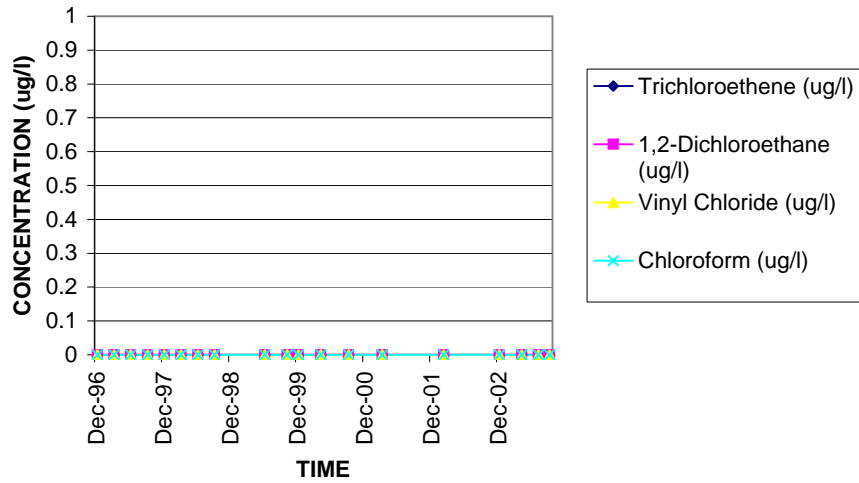
BMW-4 VOCS



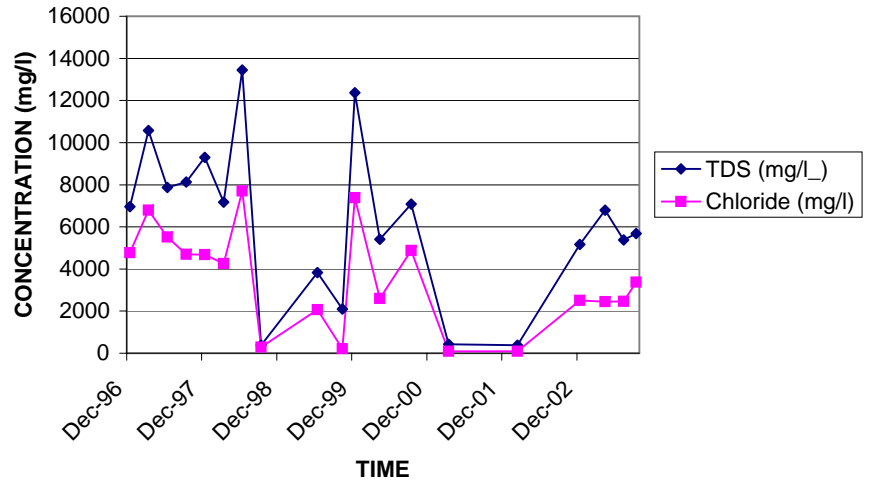
BMW-4 METALS



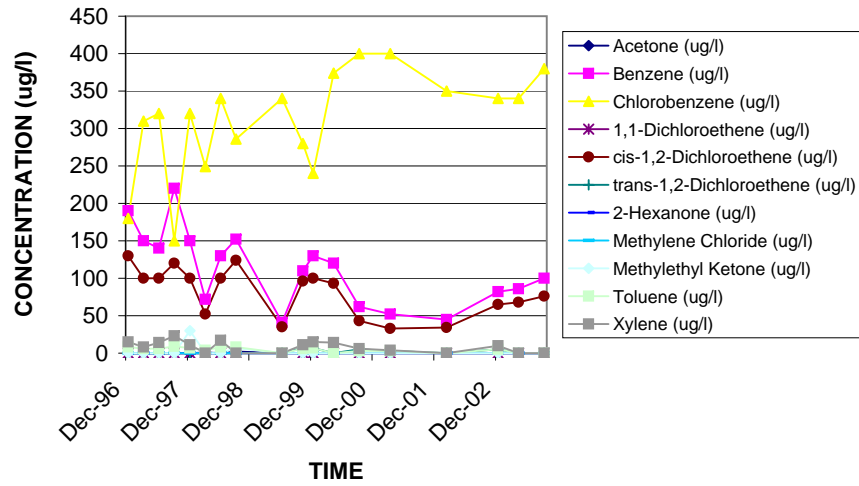
BMW-4 CHLORINATED VOCS



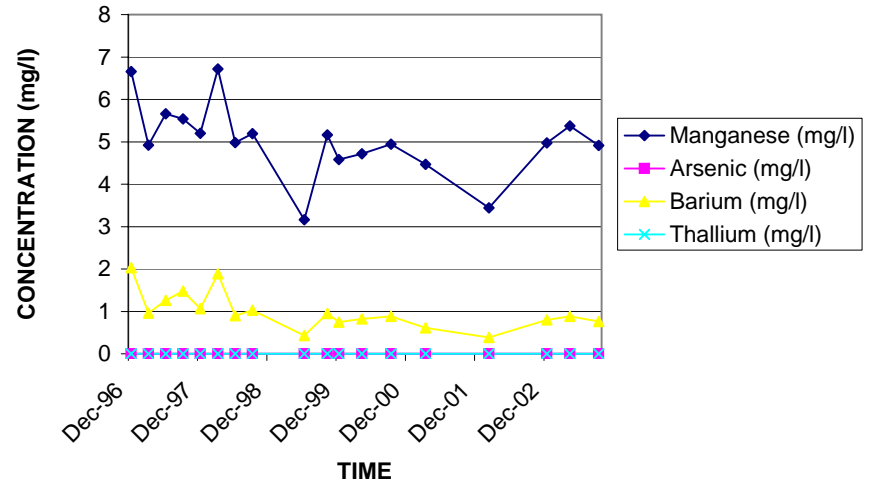
BMW-4 TDS AND CHLORIDE



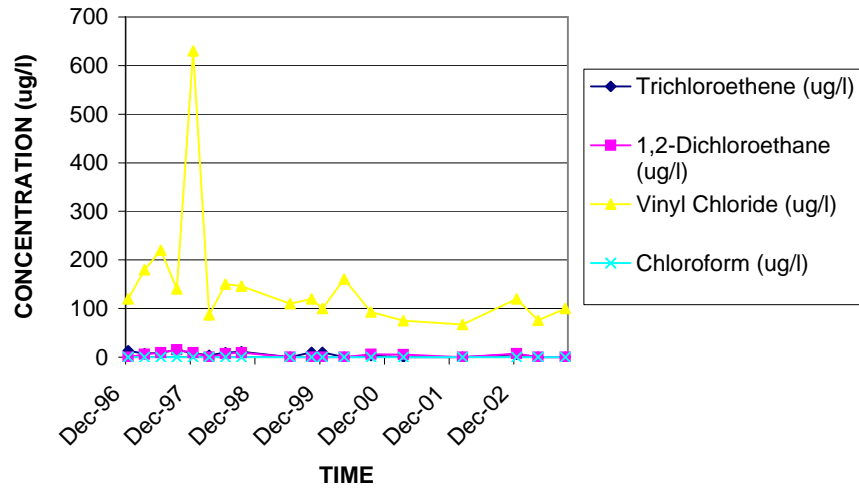
BMW-5 VOCS



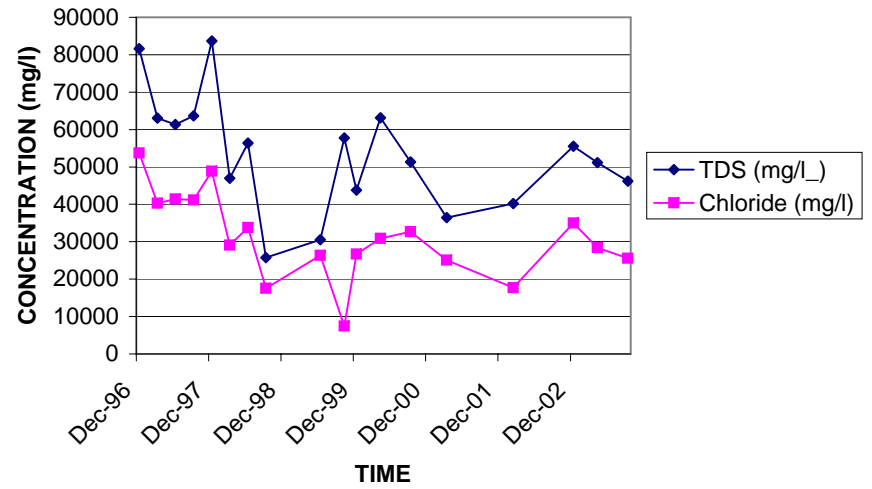
BMW-5 METALS



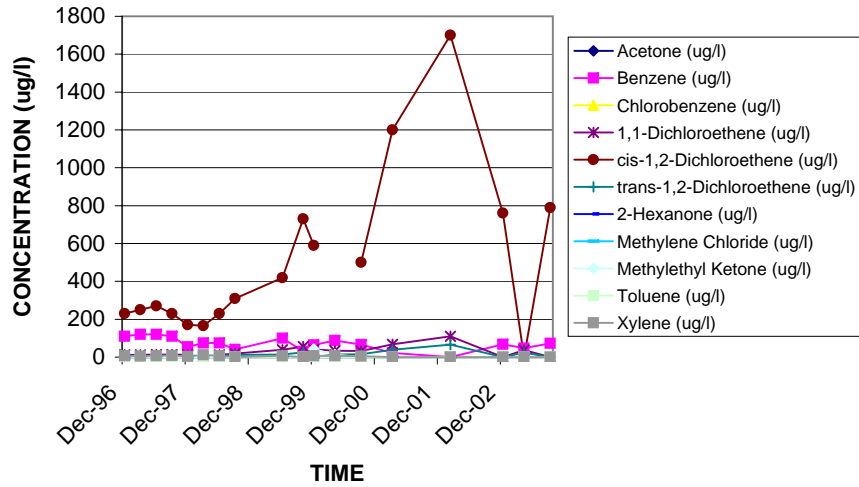
BMW-5 CHLORINATED VOCS



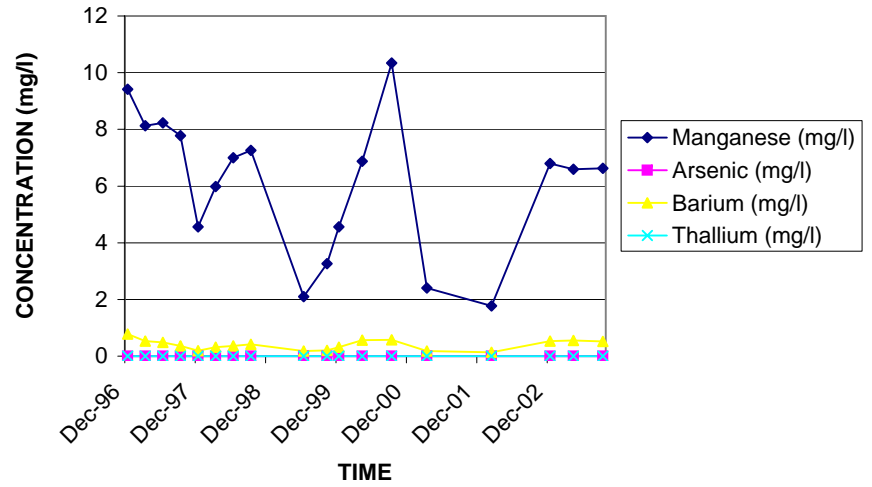
BMW-5 TDS AND CHLORIDE



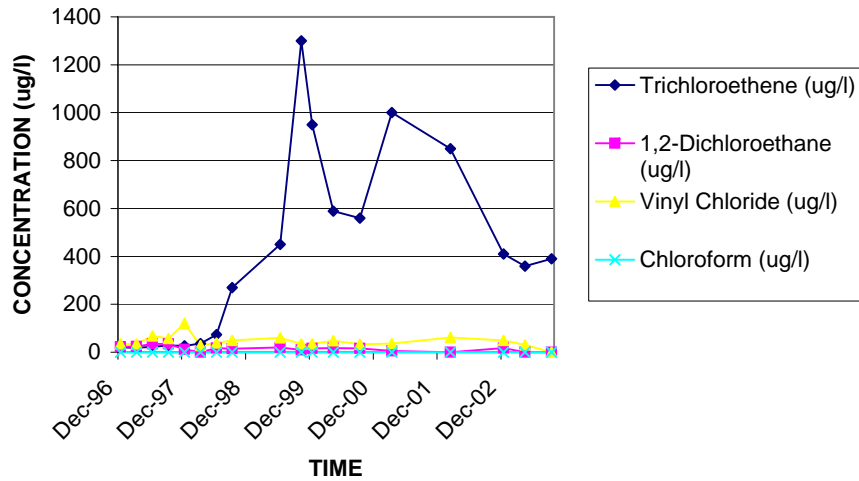
BMW-6A VOCS



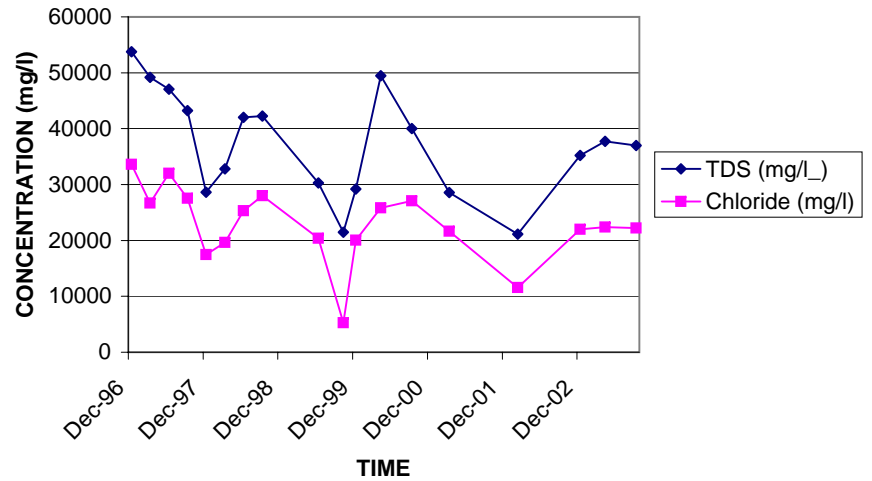
BMW-6A METALS



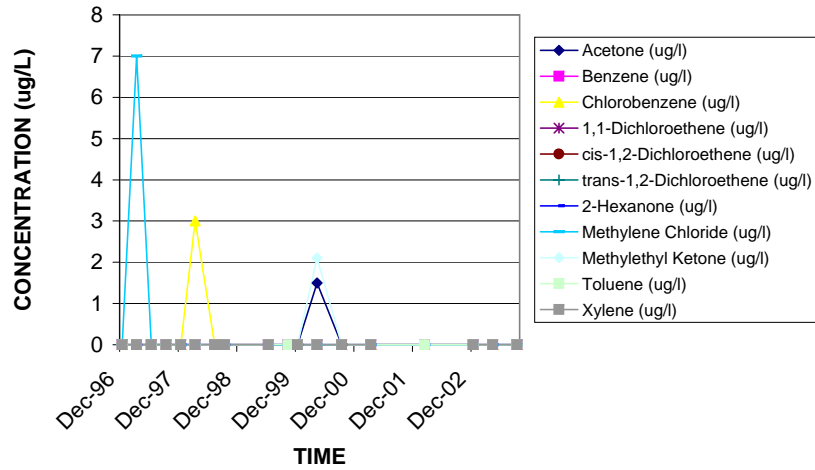
BMW-6A CHLORINATED VOCS



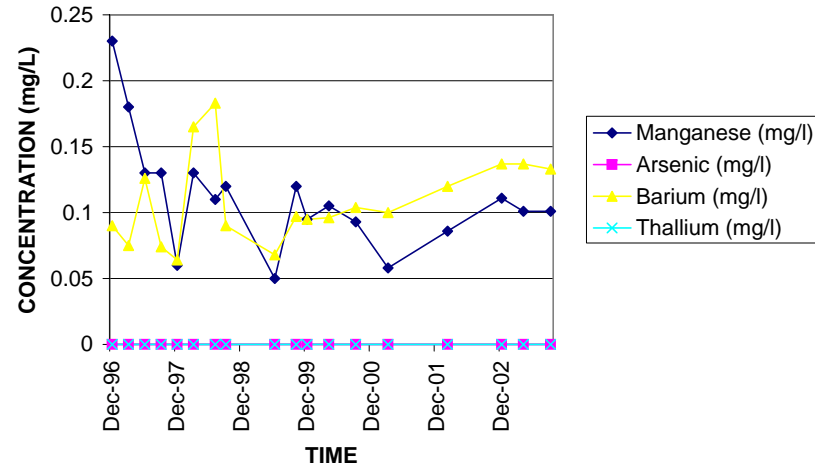
BMW-6A TDS AND CHLORIDE



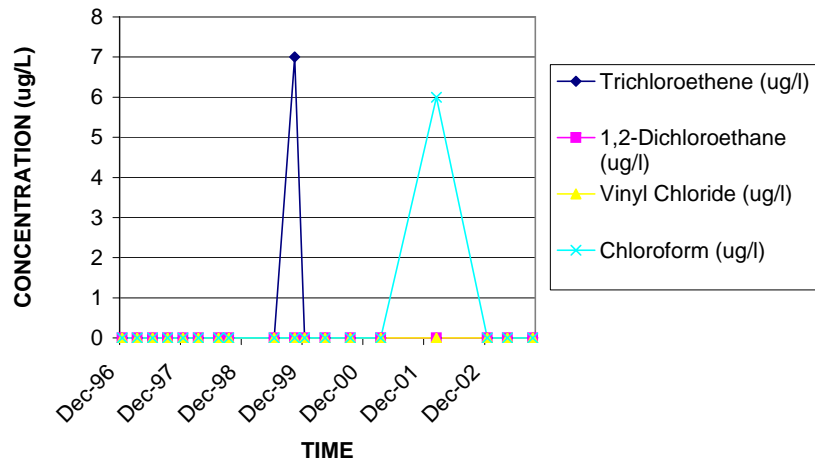
BMW-7 VOCS



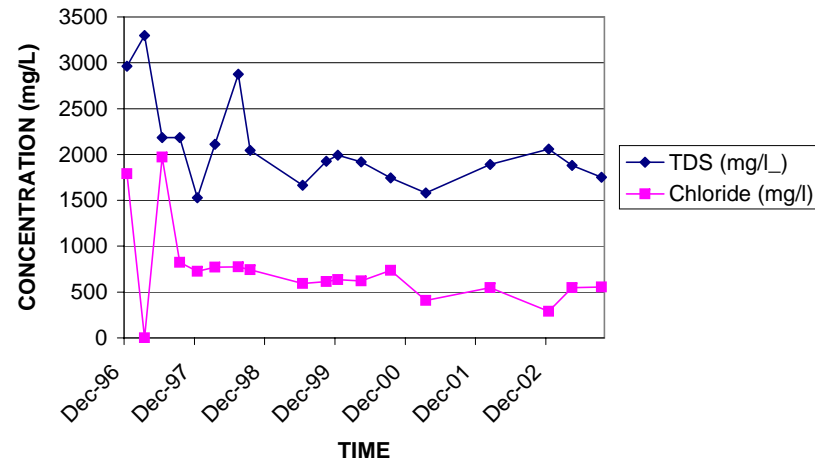
BMW-7 METALS



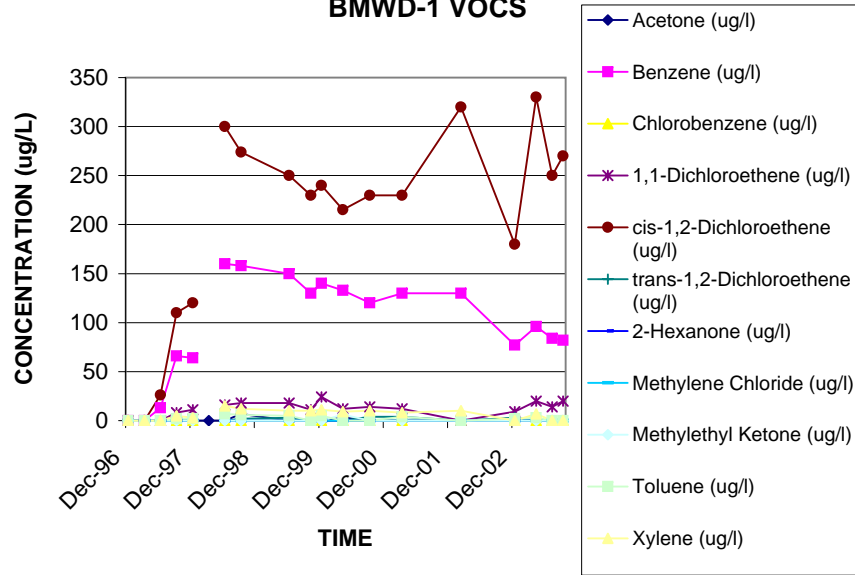
BMW-7 CHLORINATED VOCS



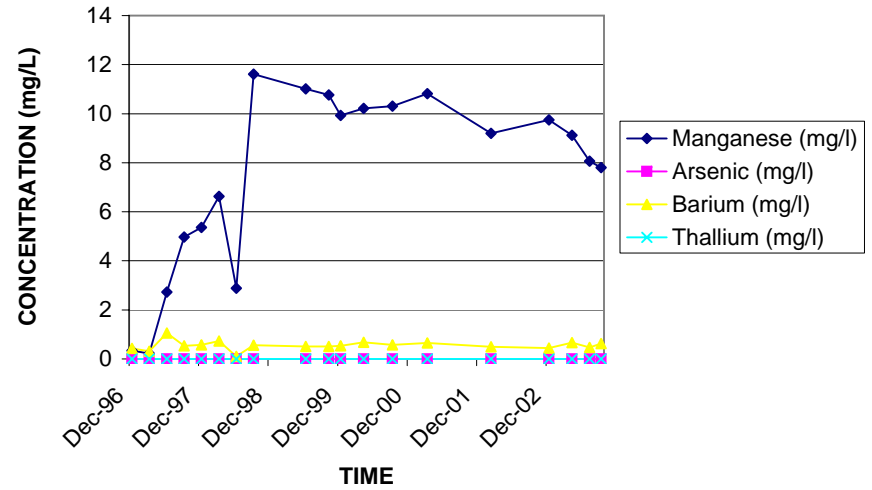
BMW-7 TDS AND CHLORIDE



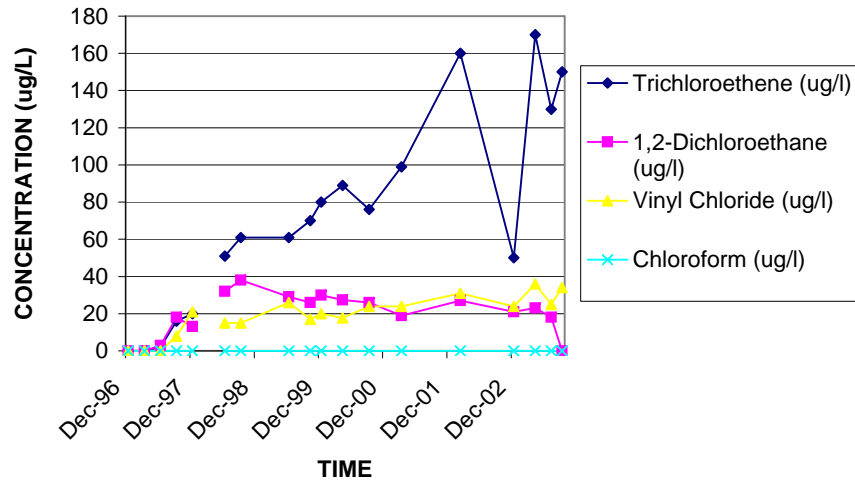
BMWD-1 VOCS



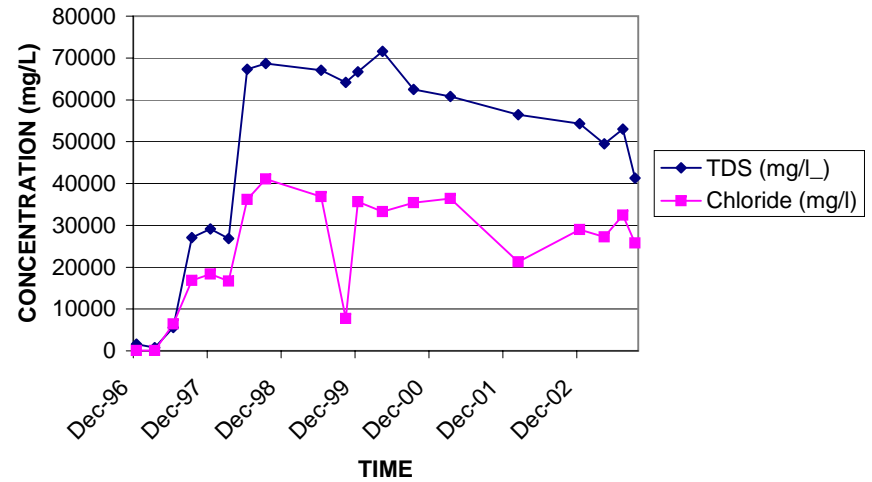
BMWD-1 METALS



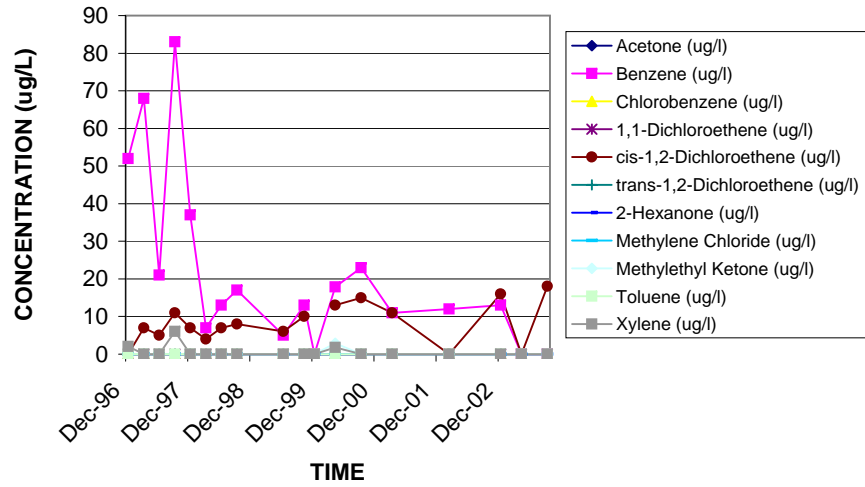
BMWD-1 CHLORINATED VOCS



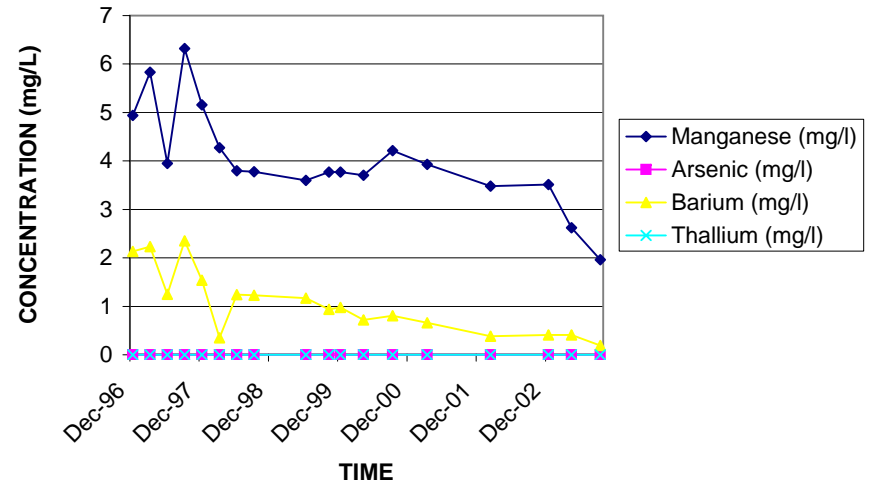
BMWD-1 TDS AND CHLORIDE



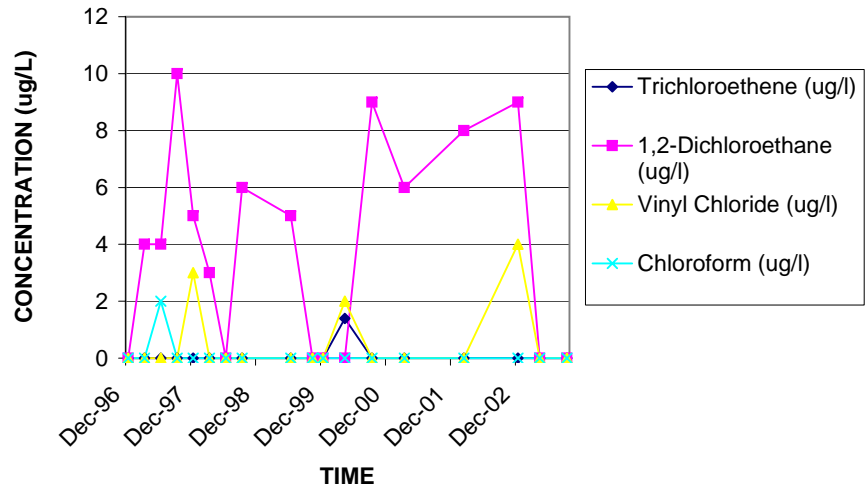
BMWD-2 VOCS



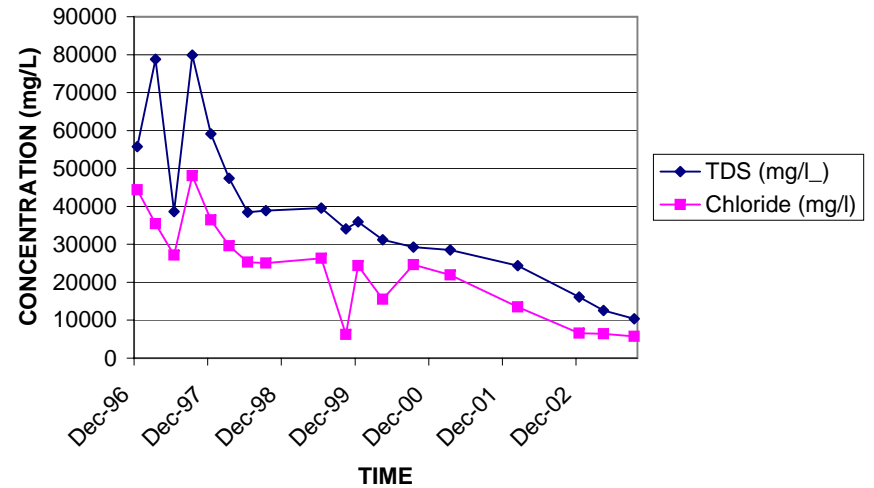
BMWD-2 METALS



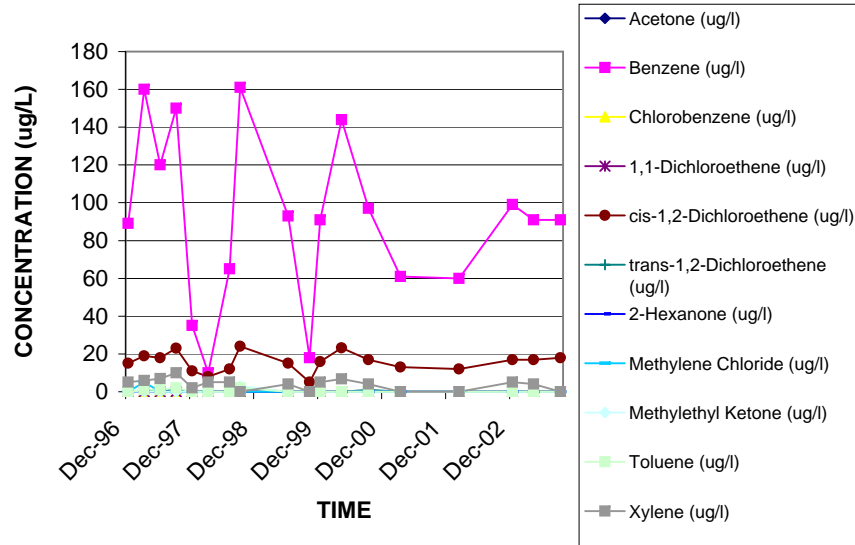
BMWD-2 CHLORINATED VOCS



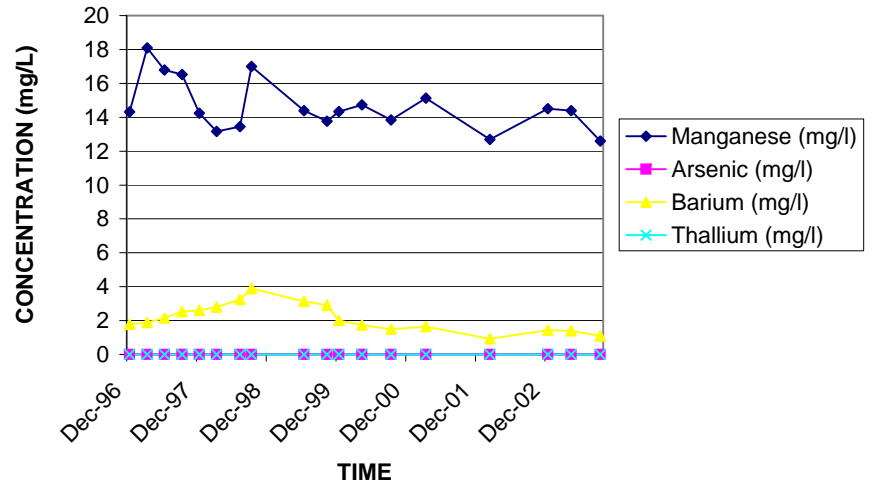
BMWD-2 TDS AND CHLORIDE



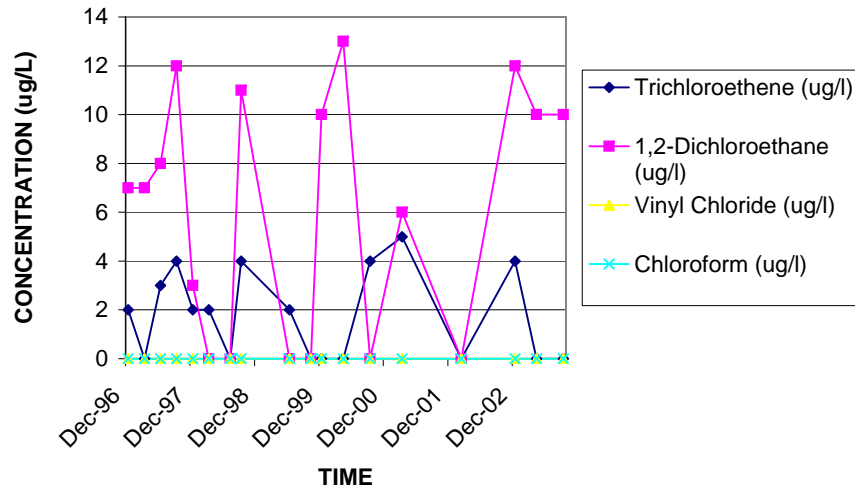
BMWD-3 VOCS



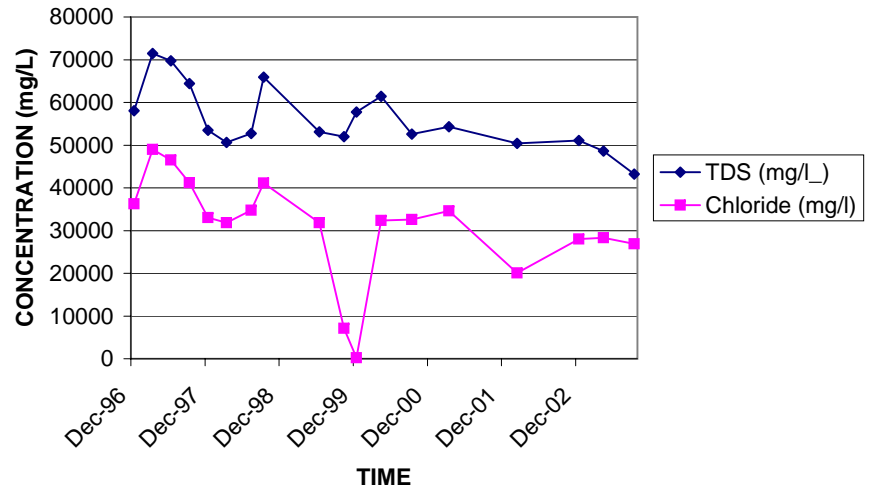
BMWD-3 METALS

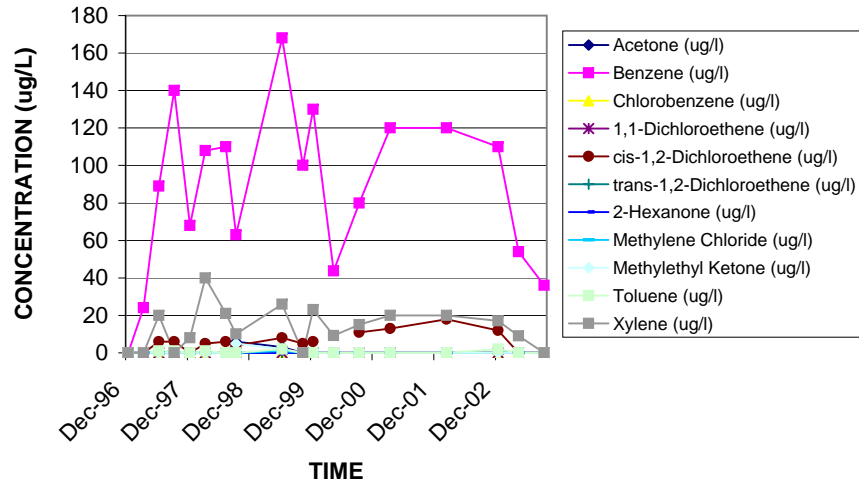
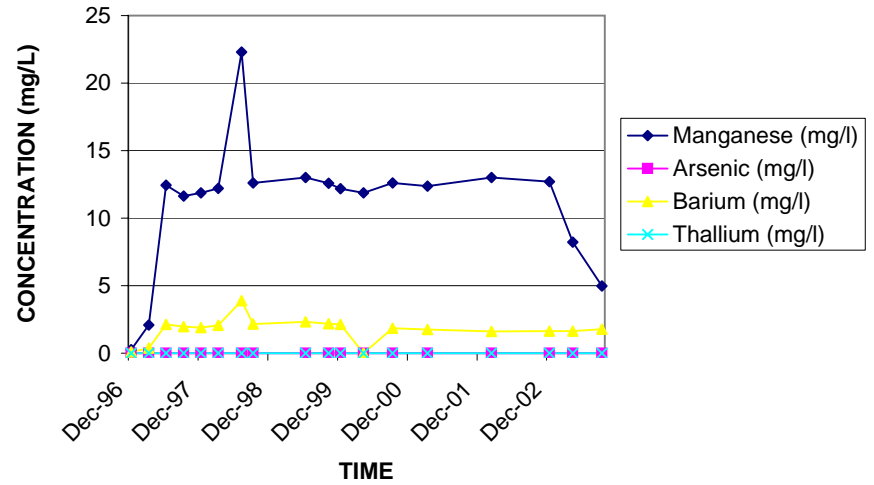
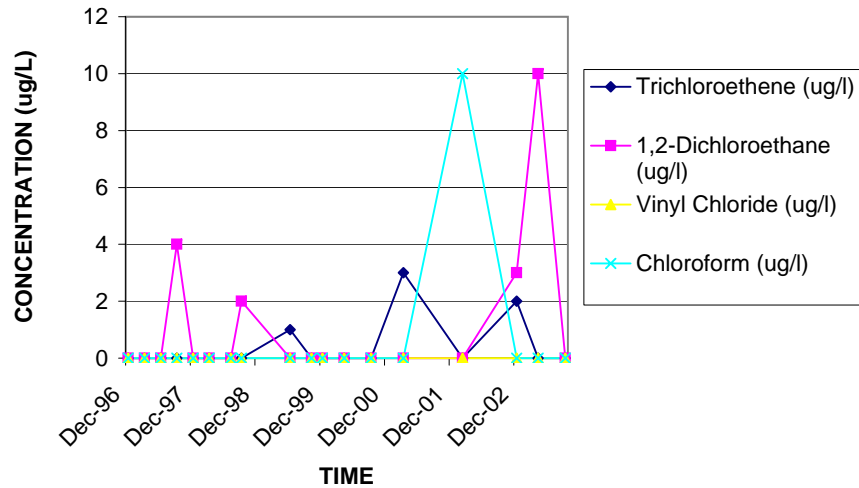
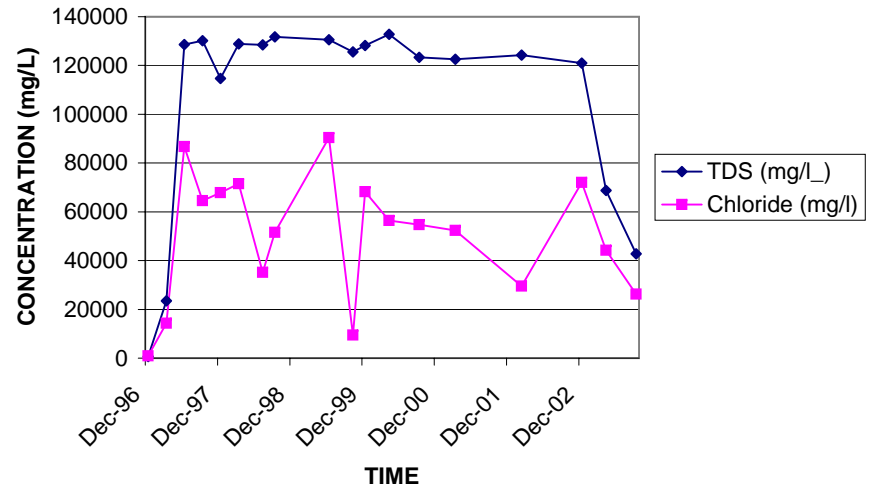


BMWD-3 CHLORINATED VOCS

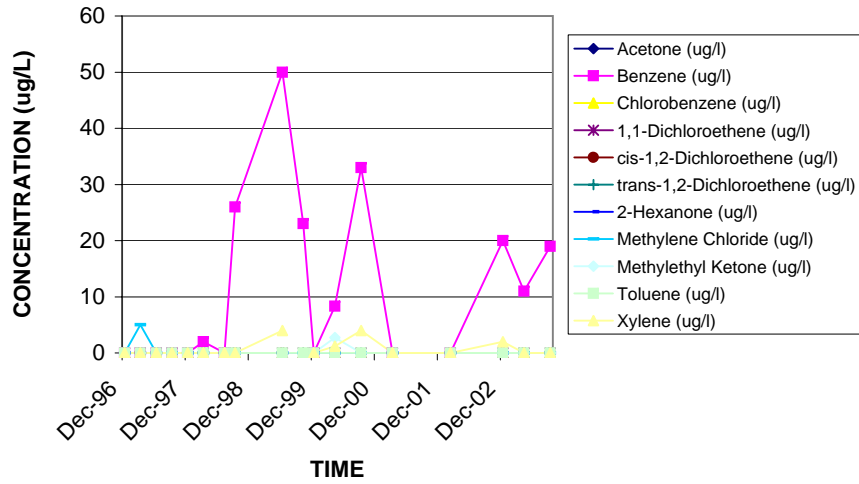


BMWD-3 TDS AND CHLORIDE

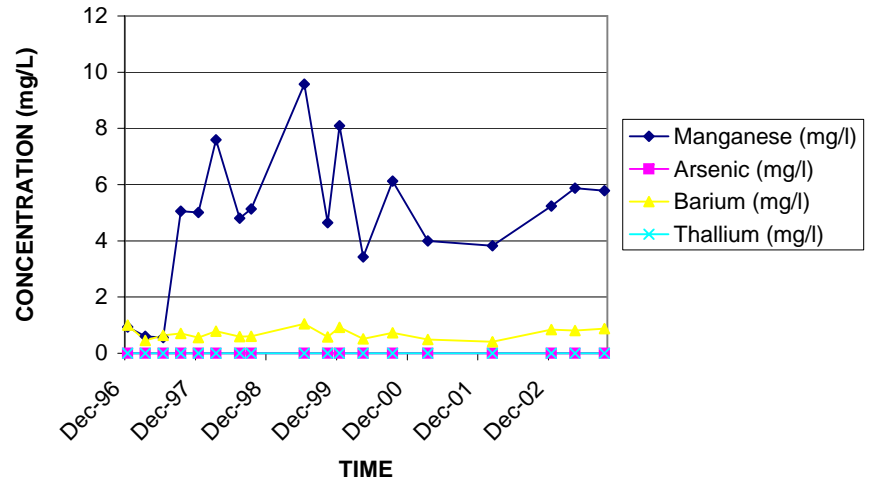


BMWD-4 VOCS**BMWD-4 METALS****BMWD-4 CHLORINATED VOCS****BMWD-4 TDS AND CHLORIDE**

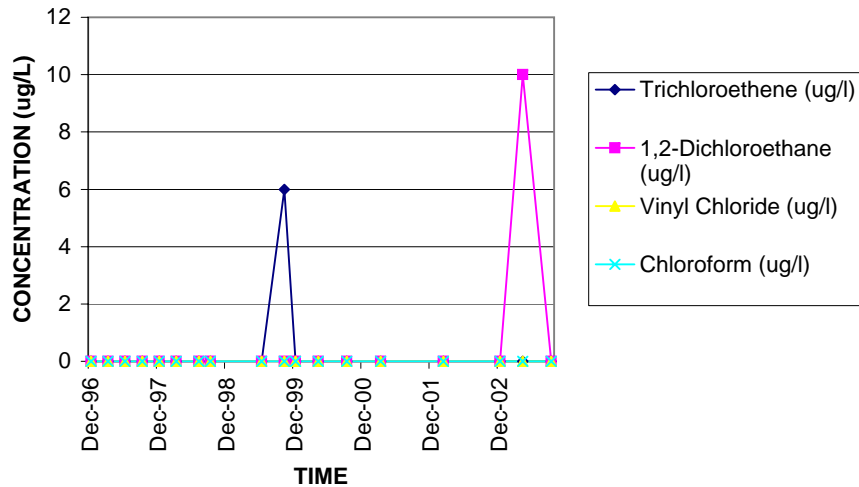
BMWD-5 VOCS



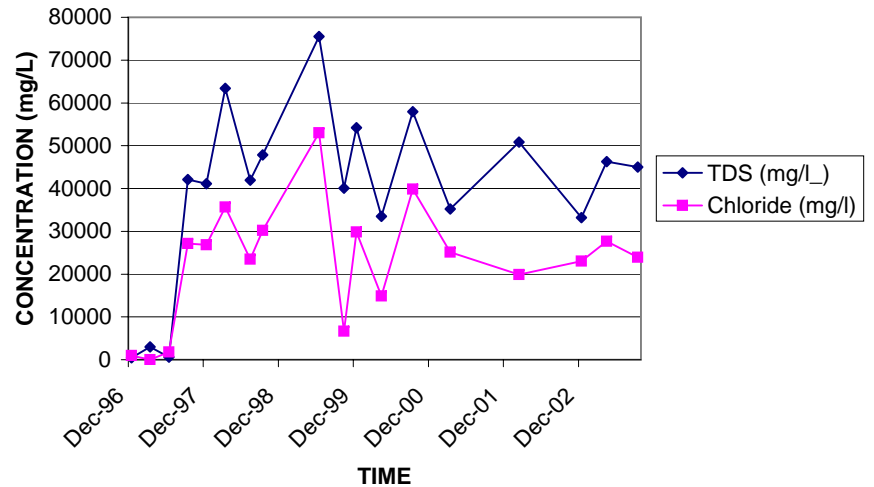
BMWD-5 METALS

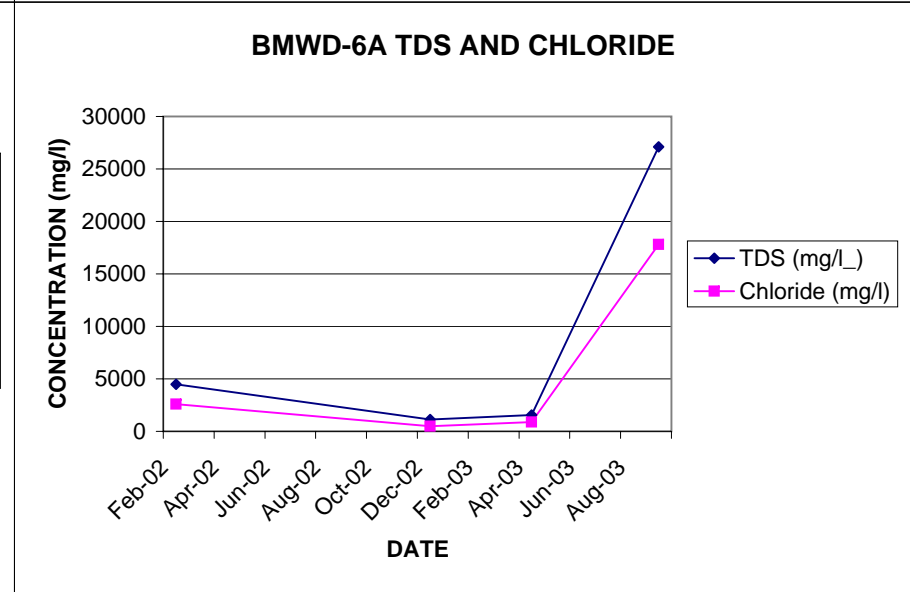
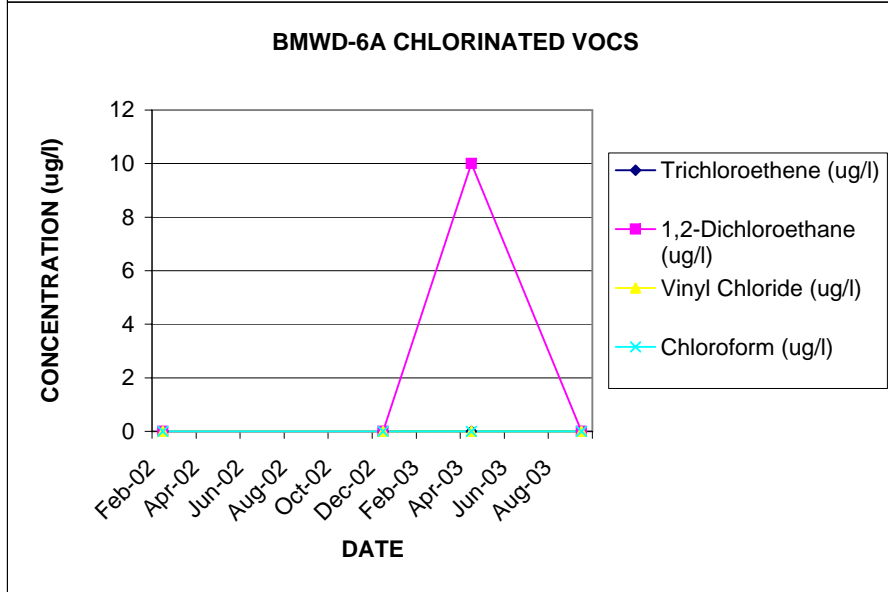
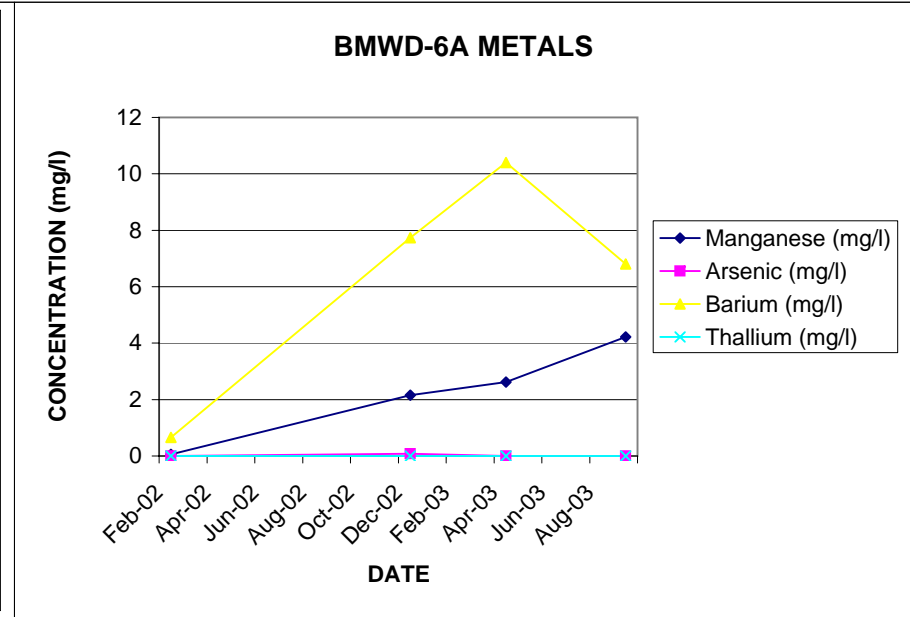
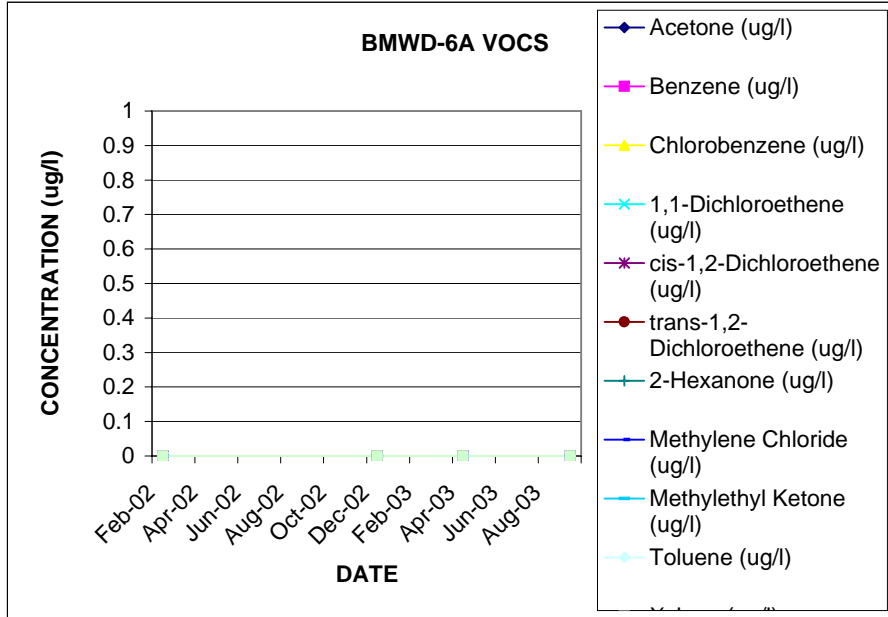


BMWD-5 CHLORINATED VOCS



BMWD-5 TDS AND CHLORIDE





Appendix 4



Photo 1: The Double Eagle Superfund site from the west looking towards the east.



Photo 2: A warning sign at the Double Eagle Superfund site.



Photo 3: The Fourth Street Superfund site looking towards the southwest.

Appendix 5

Site Inspection Checklist

I. SITE INFORMATION			
Site name: Double Eagle and 4 th Street	Date of inspection: December 19, 2006		
Location and Region: Oklahoma City, OK, Region 6	EPA ID: OKD007188717 and OKD980696470		
Agency, office, or company leading the five-year review: ODEQ	Weather/temperature: Cloudy, 40° F, light north wind		
Remedy Includes: (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Landfill cover/containment <input type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input type="checkbox"/> Other _____ </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls </td> </tr> </table>		<input type="checkbox"/> Landfill cover/containment <input type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input type="checkbox"/> Other _____	<input type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls
<input type="checkbox"/> Landfill cover/containment <input type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input type="checkbox"/> Other _____	<input type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls		
Attachments: Inspection team roster attached Site map attached			
II. INTERVIEWS (Check all that apply)			
1. O&M site manager _____ _____ _____ <div style="display: flex; justify-content: space-between; margin-left: 100px;"> Name Title Date </div> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____ Problems, suggestions; <input type="checkbox"/> Report attached _____ _____			
2. O&M staff _____ _____ _____ <div style="display: flex; justify-content: space-between; margin-left: 100px;"> Name Title Date </div> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____ Problems, suggestions; <input type="checkbox"/> Report attached _____ _____			

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency The City of Oklahoma City
Contact Jimmie Hammontree Brownfields Coordinator January 29, 2007 405-297-1639
Name Title Date Phone no.
Problems; suggestions; Report attached See Appendix 6 – Interviews

Agency Land Legacy
Contact Robert Gregory Executive Director February 2, 2007 (918) 587-2190
Name Title Date Phone no.
Problems; suggestions; Report attached See Appendix 6 – Interviews

Agency Oklahoma Department of Environmental Quality
Contact Dennis Datin Engineer January 31, 2007 405-702-5125
Name Title Date Phone no.
Problems; suggestions; Report attached See Appendix 6 – Interviews

Agency _____
Contact _____
Name Title Date Phone no.
Problems; suggestions; Report attached _____

4. **Other interviews** (optional) Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	O&M Documents O&M manual As-built drawings Maintenance logs Remarks _____ _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
2.	Site-Specific Health and Safety Plan Contingency plan/emergency response plan Remarks _____ _____	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
3.	O&M and OSHA Training Records Remarks _____ _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
4.	Permits and Service Agreements Air discharge permit Effluent discharge Waste disposal, POTW Other permits _____ Remarks _____ _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
5.	Gas Generation Records Remarks _____ _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
6.	Settlement Monument Records Remarks _____ _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
7.	Groundwater Monitoring Records Remarks _____ _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
8.	Leachate Extraction Records Remarks _____ _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
9.	Discharge Compliance Records Air Water (effluent) Remarks _____ _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
		<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
10.	Daily Access/Security Logs Remarks _____ _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A

IV. O&M COSTS

1. **O&M Organization**

State in-house Contractor for State
 PRP in-house Contractor for PRP
 Federal Facility in-house Contractor for Federal Facility
 Other _____

2. **O&M Cost Records**

Readily available Up to date
 Funding mechanism/agreement in place
 Original O&M cost estimate _____ Breakdown attached

Total annual cost by year for review period if available

From _____	To _____	_____	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From _____	To _____	_____	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From _____	To _____	_____	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From _____	To _____	_____	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	
From _____	To _____	_____	<input type="checkbox"/> Breakdown attached
Date	Date	Total cost	

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS Applicable N/A

A. Fencing

1. **Fencing damaged** Location shown on site map Gates secured N/A

Remarks _____

B. Other Access Restrictions

1. **Signs and other security measures** Location shown on site map N/A

Remarks _____

C. Institutional Controls (ICs)			
1.	Implementation and enforcement	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
	Site conditions imply ICs not properly implemented	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
	Site conditions imply ICs not being fully enforced	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
	Type of monitoring (<i>e.g.</i> , self-reporting, drive by) <u>OWRB Drilling Record Search</u>		
	Frequency <u>two times per year</u>		
	Responsible party/agency <u>ODEQ</u>		
	Contact <u>Amy Brittain</u> <u>Environmental Programs Specialist</u>	<u>12/19/2006</u>	<u>405-702-5133</u>
	Name	Title	Date Phone no.
	Reporting is up-to-date	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
	Reports are verified by the lead agency	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
	Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
	Violations have been reported	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
	Other problems or suggestions: <input type="checkbox"/> Report attached		

2.	Adequacy	<input checked="" type="checkbox"/> ICs are adequate	<input type="checkbox"/> ICs are inadequate
	Remarks _____		<input type="checkbox"/> N/A

D. General			
1.	Vandalism/trespassing	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No vandalism evident
	Remarks _____		

2.	Land use changes on site	<input type="checkbox"/> N/A	
	Remarks <u>None</u>		

3.	Land use changes off site	<input type="checkbox"/> N/A	
	Remarks <u>None</u>		

VI. GENERAL SITE CONDITIONS			
A. Roads			
	<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A	
1.	Roads damaged	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Roads adequate
	Remarks _____		<input type="checkbox"/> N/A

B. Other Site Conditions			
Remarks _____ _____ _____ _____			
VII. LANDFILL COVERS <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
A. Landfill Surface			
1.	Settlement (Low spots) Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> Settlement not evident
2.	Cracks Lengths _____ Widths _____ Depths _____ Remarks _____	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Cracking not evident
3.	Erosion Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> Erosion not evident
4.	Holes Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Depth _____	<input type="checkbox"/> Holes not evident
5.	Vegetative Cover ▶ Trees/Shrubs (indicate size and locations on a diagram) Remarks _____	<input type="checkbox"/> Grass <input type="checkbox"/> Cover properly established	<input type="checkbox"/> No signs of stress
6.	Alternative Cover (armored rock, concrete, etc.) <input type="checkbox"/> N/A Remarks _____		
7.	Bulges Areal extent _____ Remarks _____	<input type="checkbox"/> Location shown on site map Height _____	<input type="checkbox"/> Bulges not evident

8.	Wet Areas/Water Damage <input type="checkbox"/> Wet areas <input type="checkbox"/> Ponding <input type="checkbox"/> Seeps <input type="checkbox"/> Soft subgrade Remarks _____ _____	<input type="checkbox"/> Wet areas/water damage not evident <input type="checkbox"/> Location shown on site map Areal extent _____ <input type="checkbox"/> Location shown on site map Areal extent _____ <input type="checkbox"/> Location shown on site map Areal extent _____ <input type="checkbox"/> Location shown on site map Areal extent _____
9.	Slope Instability Areal extent _____ Remarks _____ _____	<input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of slope instability
B. Benches <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	Flows Bypass Bench Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay
2.	Bench Breached Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay
3.	Bench Overtopped Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> N/A or okay
C. Letdown Channels <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	Settlement Areal extent _____ Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of settlement
2.	Material Degradation Material type _____ Areal extent _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of degradation
3.	Erosion Areal extent _____ Depth _____ Remarks _____ _____	<input type="checkbox"/> Location shown on site map <input type="checkbox"/> No evidence of erosion

4.	Undercutting	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> No evidence of undercutting
	Areal extent _____	Depth _____	
	Remarks _____		
5.	Obstructions	Type _____	<input type="checkbox"/> No obstructions
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Size _____		
	Remarks _____		
6.	Excessive Vegetative Growth	Type _____	
	<input type="checkbox"/> No evidence of excessive growth		
	<input type="checkbox"/> Vegetation in channels does not obstruct flow		
	<input type="checkbox"/> Location shown on site map	Areal extent _____	
	Remarks _____		
D. Cover Penetrations <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	Gas Vents	<input type="checkbox"/> Active	<input type="checkbox"/> Passive
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Evidence of leakage at penetration		<input type="checkbox"/> Needs Maintenance
	<input type="checkbox"/> N/A		
	Remarks _____		
2.	Gas Monitoring Probes	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Properly secured/locked		<input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A
	Remarks _____		
3.	Monitoring Wells (within surface area of landfill)	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Properly secured/locked		<input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A
	Remarks _____		
4.	Leachate Extraction Wells	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition
	<input type="checkbox"/> Properly secured/locked		<input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A
	Remarks _____		
5.	Settlement Monuments	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed <input type="checkbox"/> N/A
	Remarks _____		

E. Gas Collection and Treatment			<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Gas Treatment Facilities <input type="checkbox"/> Flaring <input type="checkbox"/> Thermal destruction <input type="checkbox"/> Collection for reuse <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____			
2.	Gas Collection Wells, Manifolds and Piping <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____			
3.	Gas Monitoring Facilities (<i>e.g.</i> , gas monitoring of adjacent homes or buildings) <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____			
F. Cover Drainage Layer			<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Outlet Pipes Inspected Remarks _____ _____	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A	
2.	Outlet Rock Inspected Remarks _____ _____	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A	
G. Detention/Sedimentation Ponds			<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Siltation Areal extent _____ Depth _____ <input type="checkbox"/> Siltation not evident Remarks _____ _____			<input type="checkbox"/> N/A
2.	Erosion Areal extent _____ Depth _____ <input type="checkbox"/> Erosion not evident Remarks _____ _____			
3.	Outlet Works Remarks _____ _____	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A	
4.	Dam Remarks _____ _____	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A	

H. Retaining Walls		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Deformations	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
	Horizontal displacement_____	Vertical displacement_____	
	Rotational displacement_____		
	Remarks_____		

2.	Degradation	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
	Remarks_____		

I. Perimeter Ditches/Off-Site Discharge		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Siltation	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Siltation not evident
	Areal extent_____	Depth_____	
	Remarks_____		

2.	Vegetative Growth	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	<input type="checkbox"/> Vegetation does not impede flow		
	Areal extent_____	Type_____	
	Remarks_____		

3.	Erosion	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Erosion not evident
	Areal extent_____	Depth_____	
	Remarks_____		

4.	Discharge Structure	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks_____		

VIII. VERTICAL BARRIER WALLS		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Settlement	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
	Areal extent_____	Depth_____	
	Remarks_____		

2.	Performance Monitoring	Type of monitoring_____	
	<input type="checkbox"/> Performance not monitored		
	Frequency_____	<input type="checkbox"/> Evidence of breaching	
	Head differential_____		
	Remarks_____		

IX. GROUNDWATER/SURFACE WATER REMEDIES <input type="checkbox"/> Applicable <input type="checkbox"/> N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	Pumps, Wellhead Plumbing, and Electrical <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks _____ _____
2.	Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	Spare Parts and Equipment <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____
B. Surface Water Collection Structures, Pumps, and Pipelines <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1.	Collection Structures, Pumps, and Electrical <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
2.	Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____
3.	Spare Parts and Equipment <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks _____ _____

C. Treatment System		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Treatment Train (Check components that apply) <input type="checkbox"/> Metals removal <input type="checkbox"/> Oil/water separation <input type="checkbox"/> Bioremediation <input type="checkbox"/> Air stripping <input type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Filters _____ <input type="checkbox"/> Additive (<i>e.g.</i> , chelation agent, flocculent) _____ <input type="checkbox"/> Others _____ <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input type="checkbox"/> Equipment properly identified <input type="checkbox"/> Quantity of groundwater treated annually _____ <input type="checkbox"/> Quantity of surface water treated annually _____ Remarks _____ _____		
2.	Electrical Enclosures and Panels (properly rated and functional) <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
3.	Tanks, Vaults, Storage Vessels <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
4.	Discharge Structure and Appurtenances <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks _____ _____		
5.	Treatment Building(s) <input type="checkbox"/> N/A <input type="checkbox"/> Good condition (<i>esp.</i> roof and doorways) <input type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored Remarks _____ _____		
6.	Monitoring Wells (pump and treatment remedy) <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks _____ _____		
D. Monitoring Data			
1.	Monitoring Data	<input type="checkbox"/> Is routinely submitted on time	<input type="checkbox"/> Is of acceptable quality
2.	Monitoring data suggests:	<input type="checkbox"/> Groundwater plume is effectively contained	<input type="checkbox"/> Contaminant concentrations are declining

D. Monitored Natural Attenuation			
1.	Monitoring Wells (natural attenuation remedy)		
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled
	<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs Maintenance	<input type="checkbox"/> Good condition
	Remarks _____		<input checked="" type="checkbox"/> N/A
X. OTHER REMEDIES			
Not Applicable.			
XI. OVERALL OBSERVATIONS			
A.	Implementation of the Remedy		
	The remedy is operating as planned. No significant issues noted during the site inspection.		
B.	Adequacy of O&M		
	Only O&M activity is the review of Oklahoma Water Quality Board well drilling records twice a year. This appears to be adequate.		
C.	Early Indicators of Potential Remedy Problems		
	No significant issues noted during the site inspection.		
D.	Opportunities for Optimization		
	No opportunities for optimization were noted during the site inspection.		

Appendix 6

INTERVIEW DOCUMENTATION FORM

The following is a list of individuals interviewed for this five-year review. See the attached contact record(s) for a detailed summary of the interviews.

<u>Jimmie Hammontree</u> Name	<u>Brownfields</u> <u>Coordinator</u> Title/Position	<u>The City of</u> <u>Oklahoma City</u> Organization	<u>January 29, 2007</u> Date
<u>Robert Gregory</u> Name	<u>Executive Director</u> Title/Position	<u>Land Legacy</u> Organization	<u>February 2, 2007</u> Date
<u>Dennis Datin</u> Name	<u>Engineer</u> Title/Position	<u>Oklahoma DEQ</u> Organization	<u>January 31, 2007</u> Date
<u>Bart Canellas</u> Name	<u>EPA RPM</u> Title/Position	<u>US EPA</u> Organization	<u>January 30, 2007</u> Date
<u>George L. Pettigrew</u> Name	<u>Senior Regional</u> <u>Representative</u> Title/Position	<u>ATSDR, Region VI</u> Organization	<u>February 1, 2007</u> Date

INTERVIEW RECORD

Site Name: Double Eagle and Fourth Street Superfund Sites	EPA ID No.: OKD980696470 and OKD007188717
--	--

Subject: Five Year Review	Time: 10:30 am	Date: 1/29/07
----------------------------------	-----------------------	----------------------

Type: <input type="checkbox"/> Telephone <input checked="" type="checkbox"/> Visit <input type="checkbox"/> Other Location of Visit: DEQ office in Oklahoma City	<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing
---	---

Contact Made By:

Name: Amy Brittain	Title: Environmental Programs Specialist	Organization: DEQ
---------------------------	---	--------------------------

Individual Contacted:

Name: Jimmie Hammontree	Title: Brownfields Coordinator	Organization: The City of Oklahoma City, Planning Department, Urban Redevelopment Division
--------------------------------	---------------------------------------	---

Telephone No: 405-297-1639 Fax No: E-Mail Address: jimmie.hammontree@okc.gov	Street Address: 420 West Main Street, 9 th Floor City, State, Zip: Oklahoma City, OK 73102
---	--

Summary Of Conversation

1. What is your overall impression of the project? Glad that approach was taken, that the sites were cleaned-up so they could be reused and that waste was not left on-site.
2. How has the City of Oklahoma City been involved with both sites in the last 5-years? The city has been trying to get redevelopment in this area of the city, called the "Reno Corridor." The city has also been looking at adjacent properties in this area under the city's Brownfields program.
3. Have there been any complaints, violations, or other incidents related to the sites requiring a response by your office? If so, please give details of the events and results of the responses. Only complaints received have been about odors, but it is probably from adjacent operations. Also, after a recent fire in an empty field to the southwest of Double Eagle, the City discovered some historic dumping grounds. The landowners were notified to clean it up. Nothing related to previous activities at the Superfund sites was identified.

INTERVIEW RECORD

Site Name: Double Eagle and Fourth Street Superfund Sites	EPA ID No.: OKD980696470 and OKD007188717
--	--

Subject: Five Year Review	Time: 10:30 am	Date: 1/29/07
----------------------------------	-----------------------	----------------------

Type: <input type="checkbox"/> Telephone <input checked="" type="checkbox"/> Visit <input type="checkbox"/> Other Location of Visit: DEQ office in Oklahoma City	<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing
---	---

Contact Made By:

Name: Amy Brittain	Title: Environmental Programs Specialist	Organization: DEQ
---------------------------	---	--------------------------

Individual Contacted:

Name: Jimmie Hammontree	Title: Brownfields Coordinator	Organization: The City of Oklahoma City, Planning Department, Urban Redevelopment Division
--------------------------------	---------------------------------------	---

Telephone No: 405-297-1639 Fax No: E-Mail Address: jimmie.hammontree@okc.gov	Street Address: 420 West Main Street, 9 th Floor City, State, Zip: Oklahoma City, OK 73102
---	--

Summary Of Conversation

4. Do you feel well informed about the sites' activities and progress? Yes now the city is, but historically the Planning Department was not well informed during earlier stages of the work on the site.

5. Do you have any comments, suggestions, or recommendations regarding the sites' management or operation? The Fourth Street site does not have any visible warning signs.

6. Have there been any changes in the actual or projected land use for these sites? The city still foresees the sites as light industrial or commercial. The Fourth Street site may be better for commercial because of its location.

INTERVIEW RECORD

Site Name: Double Eagle and Fourth Street Superfund Sites	EPA ID No.: OKD980696470 and OKD007188717
--	--

Subject: Five Year Review	Time: 2:43 pm	Date: 2/2/07
----------------------------------	----------------------	---------------------

Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Other Location of Visit: Email	<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing
---	---

Contact Made By:

Name: Amy Brittain	Title: Environmental Programs Specialist	Organization: DEQ
---------------------------	---	--------------------------

Individual Contacted:

Name: Robert Gregory	Title: Executive Director	Organization: Land Legacy
-----------------------------	----------------------------------	----------------------------------

Telephone No: (918) 587-2190	Street Address:
Fax No:	City, State, Zip: Tulsa, OK
E-Mail Address: rgregory@landlegacy.com	

Summary Of Conversation

1. What is your overall impression of the Double Eagle project?

The Double Eagle project is an innovative effort to transform idle land, once contaminated but since cleaned for re-use, into productive and economically viable properties. The strategy for re-use developed by the City utilizes a common-sense approach to solve a complicated legal stand-off between regulatory agencies and the current landowner. Further, successful completion of the effort underway would help to revitalize the neighborhood and encourage urban infill, rather than continued urban sprawl.

2. How has your organization been involved with the Double Eagle site in the last 5-years?

Land Legacy has been working closely with the City of Oklahoma City, the current landowner, the potential new landowner, and the EPA to help craft an action plan for the property's productive re-use. We have not, though, acquired the property or conducted any activities on the site.

3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses.

To the contrary, Land Legacy has only received praise and encouragement from other organizations, public officials, and interested citizens for our involvement with this project.

INTERVIEW RECORD

Site Name: Double Eagle and Fourth Street Superfund Sites	EPA ID No.: OKD980696470 and OKD007188717	
Subject: Five Year Review	Time: 2:43 pm	Date: 2/2/07
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Other	<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing	
Location of Visit: Email		

Contact Made By:

Name: Amy Brittain	Title: Environmental Programs Specialist	Organization: DEQ
---------------------------	---	--------------------------

Individual Contacted:

Name: Robert Gregory	Title: Executive Director	Organization: Land Legacy
Telephone No: (918) 587-2190	Street Address:	
Fax No:	City, State, Zip: Tulsa, OK	
E-Mail Address: rgregory@landlegacy.com		

Summary Of Conversation

4. Do you feel well informed about the site's activities and progress?

The Oklahoma City Planning Department, specifically Jimmie Hammontree and Robbie Kienzle, have kept Land Legacy fully informed of all activities and progress pertaining to Double Eagle.

5. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Land Legacy is fully supportive of current efforts to re-use Double Eagle and have offered our full support to ensure it's success. We are very hopeful that the EPA will approve the City's strategy for re-use so that Land Legacy can acquire the property for subsequent conveyance and re-use by a private entity.

6. Have there been any changes in the actual or projected land use for the Double Eagle site (something other than commercial/industrial)?

Not that I am aware of.

INTERVIEW RECORD

Site Name: Double Eagle and Fourth Street Superfund Sites

EPA ID No.: OKD980696470 and
OKD007188717

Subject: Five Year Review

Time: 1:15 pm

Date: 1/31/2007

Type: Telephone Visit Other

Incoming Outgoing

Location of Visit: Email

Contact Made By:

Name: Amy Brittain

Title: Environmental Programs
Specialist

Organization: DEQ

Individual Contacted:

Name: Dennis Datin

Title: DEQ SCOU Project Manager

Organization: DEQ

Telephone No: 405-702-5125

Fax No: 405-702-5101

E-Mail Address: Dennis.Datin@deq.state.ok.us

Street Address: 707 N. Robinson

City, State, Zip: Oklahoma City, OK 73101

Summary Of Conversation

1. What is your overall impression of the project?

Good

2. Are you aware of any communication problems with the City of Oklahoma City, the surrounding community or the public?

No

3. Have there been any complaints, violations, or other incidents related to the sites requiring a response by your office? If so, please give details of the events and results of the responses.

None that I know of.

INTERVIEW RECORD

Site Name: Double Eagle and Fourth Street Superfund Sites		EPA ID No.: OKD980696470 and OKD007188717	
Subject: Five Year Review		Time: 1:15 pm	Date: 1/31/2007
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Other		<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing	
Location of Visit: Email			
Contact Made By:			
Name: Amy Brittain		Title: Environmental Programs Specialist	Organization: DEQ
Individual Contacted:			
Name: Dennis Datin		Title: DEQ SCOU Project Manager	Organization: DEQ
Telephone No: 405-702-5125		Street Address: 707 N. Robinson	
Fax No: 405-702-5101		City, State, Zip: Oklahoma City, OK 73101	
E-Mail Address: Dennis.Datin@deq.state.ok.us			
Summary Of Conversation			
4. Do you feel well informed about the sites' activities and progress?			
Yes			
5. Do you have any comments, suggestions, or recommendations regarding the sites' management or operation?			
No			
6. Have there been any changes in the actual or projected land use for these sites that you are aware?			
No			

INTERVIEW RECORD

Site Name: Double Eagle and Fourth Street Superfund Sites	EPA ID No.: OKD980696470 and OKD007188717	
Subject: Five Year Review	Time: 5:03 PM	Date: 1/30/07
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Other	<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing	
Location of Visit: Email		

Contact Made By:

Name: Amy Brittain	Title: Environmental Programs Specialist	Organization: DEQ
---------------------------	---	--------------------------

Individual Contacted:

Name: Bart Canellas	Title: EPA Remedial Project Manager	Organization: EPA, Region VI
----------------------------	--	-------------------------------------

Telephone No.: (214) 665-6662 Fax No.: (214) 665-6660 E-Mail Address: Canellas.Bart@epamail.epa.gov	Street Address: 1445 Ross Avenue City, State, Zip: Dallas, Texas 75202
--	---

Summary Of Conversation

1. What is your overall impression of the project?

Remediation of the sites was very successful.

2. Are you aware of any communication problems with the City of Oklahoma City, the surrounding community or the public?

I am not aware of any communication problems.

3. Have there been any complaints, violations, or other incidents related to the sites requiring a response by your office? If so, please give details of the events and results of the responses.

No additional response has been required by EPA Region 6.

INTERVIEW RECORD

Site Name: Double Eagle and Fourth Street Superfund Sites	EPA ID No.: OKD980696470 and OKD007188717
--	--

Subject: Five Year Review	Time: 5:03 PM	Date: 1/30/07
----------------------------------	----------------------	----------------------

Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Other Location of Visit: Email	<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing
---	---

Contact Made By:

Name: Amy Brittain	Title: Environmental Programs Specialist	Organization: DEQ
---------------------------	---	--------------------------

Individual Contacted:

Name: Bart Canellas	Title: EPA Remedial Project Manager	Organization: EPA, Region VI
----------------------------	--	-------------------------------------

Telephone No: (214) 665-6662 Fax No: (214) 665-6660 E-Mail Address: Canellas.Bart@epamail.epa.gov	Street Address: 1445 Ross Avenue City, State, Zip: Dallas, Texas 75202
--	---

Summary Of Conversation

4. Do you feel well informed about the sites' activities and progress?

The Oklahoma Department of Environmental Quality keeps the EPA Project Manger well informed about the sites, and site progress is reported in the EPA Superfund Site Summaries that are updated monthly and are available to the public via Internet in the EPA website.

5. Do you have any comments, suggestions, or recommendations regarding the sites' management or operation?

The State and the Oklahoma City are exploring opportunities for reuse of vacant properties such as the one occupied by the former Double Eagle Refinery and I support the reuse of the properties within the projected land uses of industrial / commercial. In 2003 the EPA risk assessor informed that these sites are suitable for both commercial and industrial use from a risk perspective.

6. Have there been any changes in the actual or projected land use for these sites that you are aware?

Through past five year reviews and the Institutional Controls in place, we have verified that land uses have not changed.

INTERVIEW RECORD

Site Name: Double Eagle and Fourth Street Superfund Sites		EPA ID No.: OKD980696470 and OKD007188717	
Subject: Five Year Review		Time: 11:41AM	Date: 2/1/2007
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Other		<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing	
Location of Visit: Email			
Contact Made By:			
Name: Bart Canellas		Title: EPA Remedial Project Manager	Organization: EPA, Region VI
Individual Contacted:			
Name: George L. Pettigrew		Title: Senior Regional Representative	Organization: ATSDR, Region VI
Telephone No: (214) 665-8361		Street Address: 1445 Ross Avenue	
Fax No: (214) 665-2237		City, State, Zip: Dallas, Texas 75202	
E-Mail Address: glp3@cdc.gov			
Summary Of Conversation			
<p>1. What is your overall impression of the project? Appears to have progressed as planned.</p> <p>2. Are you aware of any communication problems with the City of Oklahoma City, the surrounding community or the public? None have been communicated to our office.</p> <p>3. Have there been any complaints, violations, or other incidents related to the sites requiring a response by your office? If so, please give details of the events and results of the responses. None have been communicated to our office.</p>			

INTERVIEW RECORD

Site Name: Double Eagle and Fourth Street Superfund Sites		EPA ID No.: OKD980696470 and OKD007188717	
Subject: Five Year Review		Time: 11:47 AM	Date: 2/1/2007
Type: <input type="checkbox"/> Telephone <input type="checkbox"/> Visit <input checked="" type="checkbox"/> Other		<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing	
Location of Visit: Email			
Contact Made By:			
Name: Bart Canellas		Title: Remedial Project Manager	Organization: EPA, Region VI
Individual Contacted:			
Name: George L. Pettigrew		Title: Senior Regional Representative	Organization: ATSDR, Region VI
Telephone No: (214) 665-8361		Street Address: 1445 Ross Avenue	
Fax No: (214) 665-2237		City, State, Zip: Dallas, Texas 75202	
E-Mail Address: glp3@cdc.gov			
Summary Of Conversation			
<p>4. Do you feel well informed about the sites' activities and progress? Have reviewed the site information on the web page and had no questions.</p> <p>5. Do you have any comments, suggestions, or recommendations regarding the sites' management or operation? None at this time.</p> <p>6. Have there been any changes in the actual or projected land use for these sites that you are aware? No.</p>			

Appendix 7

Five-Year Review for the Double Eagle and 4th Street Superfund Sites

The Oklahoma Department of Environmental Quality (DEQ) and the U.S. Environmental Protection Agency (EPA) are beginning the five-year review of the Double Eagle and Fourth Street Superfund Sites in November 2006. The purpose of this review is to determine whether the site remedy remains protective of human health and the environment and to document the methods, findings, and conclusions of the five-year review in a report. The report will be available to the public in June 2007. This will be the second combined Five-Year Review for these sites.

The Double Eagle and Fourth Street Superfund Sites are contiguous property in Oklahoma City, Oklahoma near the intersection of Martin Luther King Avenue and NE 4th Street. These two sites share similar past operations, contaminants, a common ground water operable unit, and similar Records of Decision. Both facilities operated as oil re-refiners over many years. Historical operations resulted in wide-spread disposal of residual waste, mostly in pits, on both sites. These pits were generally acidic tar sludges with high lead concentrations. On both sites, the acidic sludges were neutralized, stabilized and transported offsite for disposal in a landfill. The excavated areas were filled with clean soil and vegetated. The clean-up was completed in 1999.

The ground water in the alluvial and shallow Garber-Wellington aquifers under the sites is contaminated with chlorinated solvents, hydrocarbons and metals from the refining operations. The selected remedy for ground water was natural attenuation and routine monitoring. In 2006 EPA issued an Explanation of Significant Difference for both sites that documents EPA's final decision to discontinue further groundwater monitoring after confirming this is a Class III (non usable water aquifer due to high total dissolved solids content of the water), conditions are adequate to support natural reduction of the contaminants, and potential receptors (surface waters and useable ground water supplies) are not likely to be affected. DEQ continues to check the sites and the surrounding area to assure that no drinking water wells are placed near the sites.

If you have any questions or need further information about the five-year review please contact Amy Brittain, DEQ, Environmental Programs Specialist, Land Protection Division, Site Remediation Section (405) 702-5133. Information about these sites is also available on EPA's website at www.epa.gov/earth16/6sf/6sf-ok.htm.

STATE OF OKLAHOMA, }
COUNTY OF OKLAHOMA } SS.

Affidavit of Publication

Kari Garner _____, of lawful age, being first duly sworn, upon

oath deposes and says that she/he is the Classified Legal Notice Admin of The Oklahoma Publishing Company, a corporation, which is the publisher of *The Oklahoman* which is a daily newspaper of general circulation in the State of Oklahoma, and which is a daily newspaper published in Oklahoma County and having paid general circulation therein; that said newspaper has been continuously and uninterruptedly published in said county and state for a period of more than one hundred and four consecutive weeks next prior to the first publication of the notice attached hereto, and that said notice was published in the following issues of said newspaper, namely:

OKLA. DEPT. OF ENVIRON QUAL.
285704 - Metro
Published on 11/21/2006

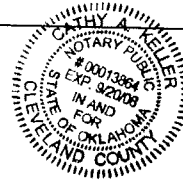
Kari Garner

Subscribed and sworn to before me this 11-28-06

Cathy A. Keller

Notary Public

My commission expires _____





FIVE-YEAR REVIEW FOR THE DOUBLE EAGLE AND 4TH STREET SUPERFUND SITES

The Oklahoma Department of Environmental Quality (DEQ) and the U.S. Environmental Protection Agency (EPA) are beginning the five-year review of the Double Eagle and Fourth Street Superfund Sites in November 2006. The purpose of this review is to determine whether the site remedy remains protective of human health and the environment and to document the methods, findings, and conclusions of the five-year review in a report. The report will be available to the public in June 2007. This will be the second combined Five-Year Review for these sites.

The Double Eagle and Fourth Street Superfund Sites are contiguous property in Oklahoma City, Oklahoma near the intersection of Martin Luther King Avenue and NE 4th Street. These two sites share similar past operations, contaminants, a common ground water operable unit, and similar Records of Decision. Both facilities operated as oil refiners over many years. Historical operations resulted in wide-spread disposal of residual waste, mostly in pits, on both sites. These pits were generally acidic tar sludges with high lead concentrations. On both sites, the acidic sludges were neutralized, stabilized and transported offsite for disposal in a landfill. The excavated areas were filled with clean soil and vegetated. The clean-up was completed in 1999.

The ground water in the alluvial and shallow Garber-Wellington aquifers under the sites is contaminated with chlorinated solvents, hydrocarbons and metals from the refining operations. The selected remedy for ground water was natural attenuation and routine monitoring. In 2006 EPA issued an Explanation of Significant Difference for both sites that documents EPA's final decision to discontinue further groundwater monitoring after confirming this is a Class III (non usable water aquifer due to high total dissolved solids content of the water), conditions are adequate to support natural reduction of the contaminants, and potential receptors (surface waters and useable ground water supplies) are not likely to be affected. DEQ continues to check the sites and the surrounding area to assure that no drinking water wells are placed near the sites.

If you have any questions or need further information about the five-year review please contact Amy Brittain, DEQ, Environmental Programs Specialist, Land Protection Division, Site Remediation Section (405) 702-5133. Information about these sites is also available on EPA's website at www.epa.gov/earth/r6/6sf/6sf-ok.htm

e.
n-
nt
al
l.
-
ay.
-
as.
w.
9-

g
t
r
l
t
r
i

In
n
C
P
a
e
l
a
C
&
N

SE
CC

TH

Ste
6/6
213
Oki

Ste
&/6
213
Oki

For
Wil
PO
Oki

For
The

Black Chronicle 12/7/2006

Appendix 8

Memorandum

February 5, 2007

To: Double Eagle and Fourth Street File

From: Amy Brittain, Environmental Programs Specialist III

Re: Deed Notice Search for the Double Eagle and Fourth Street Superfund Sites

On February 5, 2007, Amy Brittain and Aron Samwel from the DEQ went to the County Clerk, Registrar of Deeds Office at the Oklahoma County Court House in Oklahoma City to search the records to see if the deed notices filed by the DEQ for both the Double Eagle and the Fourth Street Superfund sites could be found easily by the public. By searching the county's records on computer workstations in the Registrar of Deeds Office anyone can find both deed notices with only the legal descriptions of the properties. The deed information is provided in the tables below:

Double Eagle	
Legal Description:	Unplated SE1/4 S35 T12N R3W
Date filed:	6/22/2001
Document Number:	2001084662
Book:	8127
Page:	1769
Number of Pages:	3

Fourth Street	
Legal Description:	Unplated SW1/4 S36 T12N R3W
Date filed:	6/22/2001
Document Number:	2001084663
Book:	8127
Page:	1772
Number of Pages:	3

**NOTICE OF
REMEDATION AND GROUNDWATER CONTAMINATION
FOURTH STREET REFINERY SUPERFUND SITE**

This Notice is made pursuant to Oklahoma Statutes, Title 27A (2000 Supp.), Section 2-7-123(B) concerning the former Fourth Street Refinery site. It is also noticed that groundwater contamination exists at this site in the upper alluvial aquifer and upper Garber-Wellington, approximately 50'-150' below ground surface level. Attempts to use groundwater for human consumption is not advised.

SITE DESCRIPTIONS: THE FOURTH STREET (4ST) SITE is located in the 2200 block of Northeast Fourth Street, in Oklahoma City, Oklahoma. The site is within an area occupying a portion of the southwest Quarter (SW1/4) of Section 36, Township 12 North, Range 3 West, Oklahoma County, Oklahoma. This site is bounded to the north by Northeast Fourth Street, on the east by Interstate 35, on the west by Martin Luther King Blvd., and on the south by ATSF (Union Pacific) Railroad tracks and comprises approximately 22 acres.

FOURTH STREET REFINERY collected, stored and refined used oil during the early 1940s until the 1960s or early 1970s. The recycling process included the use of sulfuric acid (H_2SO_4) and bleaching clays. Crude oil or waste oil was steam heated in tanks. Acid and bleaching clay were added to clarify and separate the desired oil product from the heavy tars. Waste consisted primarily of acidic tar material mixed with clay deposited in on-site impoundments and later spread forming tar mats. Site wastes contained a number of metals and organic contaminants. These wastes were considered hazardous because they were found to be corrosive and toxic. Contaminants were presumed to be cumulative, results of several previous oil reclaiming and refining operations operated at the site. Clean up levels were based on risk based levels established for industrial waste sites.

REMEDATION ACTION: Remediation took place under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Administrative Record for the Fourth Street Refinery site is available for review at the following locations in Oklahoma City: Ralph Ellison Library and Oklahoma Department of Environmental Quality.

Remediation activities (RA) were completed under two operable units:

Surface Contamination Operable Unit (SCOU): Work was performed for EPA under Work Assignment No. 51-6RE5 of Response Action No. 68-W9-0013 in accordance with specifications of the remedial design approved by EPA in 1994, prepared as a result of the September 1992 Record of Decision (ROD). The 4ST Site refers to the contaminated area above the water table located in four areas referred to as Tar Mat Area, Parcel H Pond, Eastern Drainage Area and Surface Impoundments. Remedial Activities included: Removal of above

ground structures associated with the refinery, asbestos abatement, and the excavation, treatment, and removal for off-site disposal of treated waste materials containing lead and acid. Waste material was excavated down to the water table. Excavated areas were backfilled, regraded, and revegetated to prevent erosion. The remedial action was completed in April 30, 1996.

Ground Water Contamination Operable Unit (GWOU): Work was performed for EPA under Work Assignment No. 57-6NES and 58-6NB1 in accordance with specifications of the remedial design prepared as a result of the October 1993 Record of Decision (ROD). Contaminants found in the ground water are similar to those found in the on-site sludges. Contaminants of Concern include lead, arsenic, and organic chemicals such as chlorinated hydrocarbons and benzene compounds. The intent of the RA was to prevent migration of contaminants from the shallow aquifer to the deeper aquifer, and to prevent migration of contaminants to the North Canadian River. The selected remedy for the site is natural attenuation. Remediation activities were performed in two phases. Phase One: the installation of piezometers and speed borings, geophysical logging and removal of a Deep Well. Phase Two: installation of ground water monitor wells to monitor the upper alluvial aquifer (approx. 50'-60' bgs) and upper portion of the Garber-Wellington (140'-150' bgs), abandonment of alluvial wells and piezometers, and installation of warning signs. Ground water monitoring of the upper alluvial aquifer and upper portion of the Garber-Wellington aquifer continues.

Appropriate Land Uses: The site is considered appropriate for activities associated with industrial/commercial uses. Cleanup levels met during remediation are not conducive for residential uses.

Dated this 19th day of June, 2001.



Mark S. Coleman, Executive Director
Department of Environmental Quality

ACKNOWLEDGMENT

STATE OF OKLAHOMA)
)
 COUNTY OF OKLAHOMA) SS:

Before me, the undersigned, a Notary Public in and for said County and State on this 19th day of June, 2001 personally appeared Mark S. Coleman to me known to be the identical person who executed the within and foregoing instrument and acknowledged to me that he executed the same as his free and voluntary act and deed for the uses and purposes therein set forth.

Given under my hand and seal the day and year last above written.

Linda Fine

My Commission expires 2-18-05

**NOTICE OF
REMEDATION & GROUNDWATER CONTAMINATION
DOUBLE EAGLE REFINERY SUPERFUND SITE**

This Notice is made pursuant to Oklahoma Statutes, Title 27A (2000 Supp.), Section 2-7-123(B), concerning the former Double Eagle Refinery site. It is also noticed that groundwater contamination exists at this site in the upper alluvial aquifer and the upper Garber Wellington, approximately 50'-150' below ground surface level. Attempts to use groundwater for human consumption is not advised.

SITE DESCRIPTIONS: THE DOUBLE EAGLE REFINERY (DER) SITE is located at 1900 Northeast First Street, in Oklahoma City, Oklahoma. The aerial extent of the site is approximately 12 acres and occupies the southeast Quarter (SE1/4) of Section 35, Township 12 North, Range 3 West, Oklahoma County, Oklahoma. It is bounded on the north by ATSF Railroad (Union Pacific) tracks and on the east by Martin Luther King Blvd.

DOUBLE EAGLE REFINERY recycled used motor oil into finished lubricating oil. The refinery was active as early as 1929, and is known to have accepted waste oil for storage until 1980. The recycling process included the use of sulfuric acid (H_2SO_4) and bleaching clays. Crude oil or waste oil was steam heated in tanks. Acid and bleaching clay were added to clarify and separate the desired oil product from the heavy tars. Waste consisted primarily of acidic tar material mixed with clay. Site wastes contained a number of metals and organic contaminants. These wastes were considered hazardous because they were found to be corrosive and toxic. Clean up levels were based on risk based levels established for industrial waste sites.

REMEDIATION ACTION: Remediation took place under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Administrative Record for the Double Eagle Refinery site is available for review at the following locations in Oklahoma City: Ralph Ellison Library and Oklahoma Department of Environmental Quality.

Remediation activities (RA) were completed under two operable units:

Surface Contamination Operable Unit (SCOU): Work was performed for EPA under Work Assignment No. 013-RA-RA-06B1 of Response Action No. 68-W6-0037 in accordance with specifications of the remedial design prepared as a result of the September 1992 Record of Decision (ROD). The DER Site refers to the contaminated area above the water table where the former used oil refinery was located west of parcel H and North of the Radio Tower.

Remedial Activities included: Asbestos abatement, and the excavation, treatment, and removal for off site disposal of 44,186 yd³ of contaminated waste materials containing lead and acid. Waste material was excavated down to the water table. Excavated areas were backfilled, regraded, and revegetated to prevent erosion. The remedial action was completed in June 29, 1999.

Ground Water Contamination Operable Unit (GWOU): Work was performed for EPA under Work Assignment No. 57-6NE5 and 58-6NB1 in accordance with specifications of the remedial design prepared as a result of the October 1993 Record of Decision (ROD). Contaminants found in the ground water are similar to those found in the on-site sludges. Contaminants of Concern include lead, arsenic, and organic chemicals such as chlorinated hydrocarbons and benzene compounds. The intent of the RA was to prevent migration of contaminants from the shallow aquifer to the deeper aquifer, and to prevent migration of contaminants to the North Canadian River. The selected remedy for the site is natural attenuation. Remediation activities were performed in two phases. Phase One: the installation of piezometers and speed borings, geophysical logging and removal of the DER Deep Well. Phase Two: installation of ground water monitor wells to monitor the upper alluvial aquifer (approx. 50'-60' bgs) and upper portion of the Garber-Wellington (140'-150' bgs), abandonment of alluvial wells and piezometers, and installation of warning signs. Ground water monitoring of the upper alluvial aquifer and upper portion of the Garber-Wellington aquifer continues.

Appropriate Land Uses: The site is considered appropriate for activities associated with industrial/commercial uses. Cleanup levels met during remediation are not conducive for residential uses.

Dated this 19th day of June, 2001.



Mark S. Coleman, Executive Director
Department of Environmental Quality

ACKNOWLEDGMENT

STATE OF OKLAHOMA)
)
COUNTY OF OKLAHOMA) SS:

Before me, the undersigned, a Notary Public in and for said County and State on this 19th day of June 2001 personally appeared _____ to me known to be the identical person who executed the within and foregoing instrument and acknowledged to me that he executed the same as his free and voluntary act and deed for the uses and purposes therein set forth.

Given under my hand and seal the day and year last above written.

Linda Fine

My Commission expires 2-18-05